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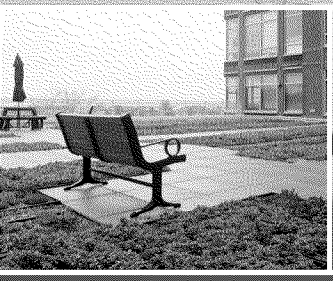
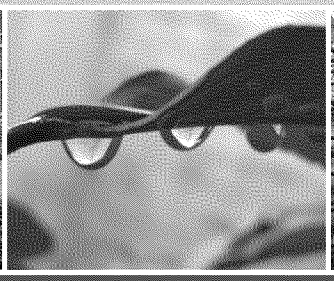
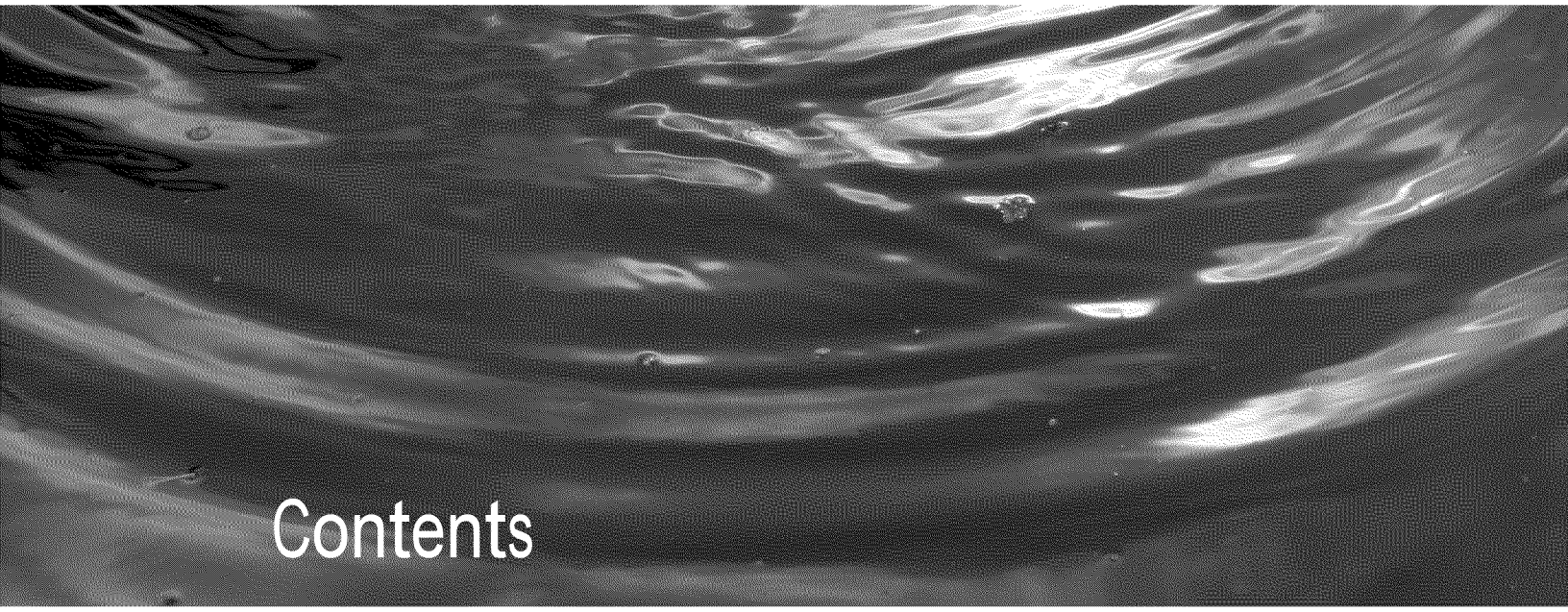




Promoting Technology Innovation for Clean and Safe Water

Water Technology Innovation Blueprint—Version 2

U.S. Environmental Protection Agency
Office of Water

April 2014



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Overview

Our freshwater resources are limited and face mounting pressures from drought, flooding,pollution, population growth, and competition from many uses (e.g., ecosystem protection, drinking water, agriculture, energy production, recreation). Technology innovation can help address our water challenges and put us on a more sustainable path while supporting economic growth. The U.S. Environmental Protection Agency (EPA) aims to be a catalyst to promote and support technology innovation to protect and ensure the sustainability of our water resources.

On March 27, 2013, EPA's Office of Water issued the *Blueprint for Integrating Technology Innovation into the National Water Program*, which highlighted EPA's initial ideas and plans for advancing technology innovation across various water programs. This document expands on those ideas and frames the business case for water technology innovation; identifies "market opportunities" where technology innovation could help solve water challenges; provides examples of emerging innovation pioneers; identifiestools for assessing water risk; and frames a more robust set of actions that EPA will take to promote technology innovation for clean and safe water.

In the past year, EPA has widely communicated the goals and opportunities of the technology initiative, engaging a broad spectrum of partners and stakeholders. For example, Acting Assistant Administrator for Water Nancy Stoner has visited many innovation pioneers to raise awareness of very promising effortsto solve water resource challenges cheaper, faster and using less energy. Effortsto promote and foster technology innovation will continue to be dynamic and evolving.

For purposes of this document, technology innovation is definedas:

> *The development and deployment of new technologies and processes; new applications of existing technology; production changes; and organizational, management and cultural changes that can improve the condition and sustainability of our water resources.*

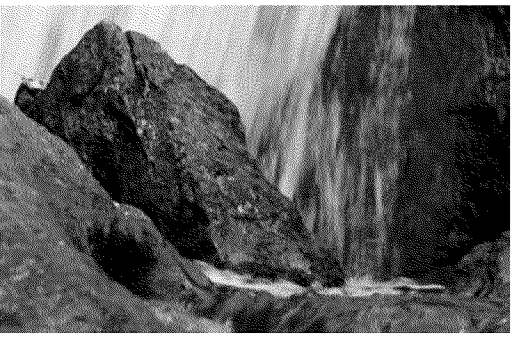
In short, this includes: (1) new technologies; (2) new management approaches (e.g., regional coordination); or (3) techniques that increase the efficiencyof existing systems (e.g., sensors and controls).[1]

"Every American deserves clean and safe water; we will achieve that goal by supporting the advancement and use of innovative technologies to meet challenges and seize opportunities in the water sector."

—EPA Administrator Gina McCarthy

"Technology innovation can accelerate progress toward our goals of clean and safe water. EPA and many stakeholders will strive to support technology innovation to solve water resource problems… cheaper, faster and using less energy!"

—EPA Acting Assistant Administrator for Water Nancy Stoner



The Business Case for Technology Innovation for Water

> "Despite consistently growing public awareness and recognition, water continues to be under-appreciated and undervalued. We need fundamental change in the way we manage, utilize and view our finitewater resources."
>
> —From the TechKNOWLEDGEy Strategy Group's *2013 Water Market Review: Growing Awareness, Growing Risks,* 2013[2]

Clean and safe water is essential for public health and healthy ecosystems, for the nation's economic well-being, and for the welfare of our families and communities. In the United States, a significantamount of water is used every day. For example, in 2005 almost 330 billion gallons of freshwater was withdrawn for use:

* 29.4 billion gallons per day was withdrawn for domestic use.
* 19.2 billion gallons per day was withdrawn for industrial and mining use.
* 138.8 billion gallons per day was withdrawn for use in farming (including agricultural and horticultural irrigation, livestock, and aquaculture).
* 142 billion gallons per day was withdrawn to produce energy in thermoelectric power plants.[3]

Water, uses of water resources, and the services to provide clean water play a significantrole in economies around the world. For example, the value of the global water market—control and cleanup of water—is estimated at $500 billion per year.[4] Many aspects of the U.S. economy also depend on large supplies of water:

* In 2012, the total revenue for the domestic U.S. water and wastewater industry was $139 billion.[5]
* In 2011, 44 million anglers spent $48 billion to fishin U.S. waters.[6]
* In 2007, irrigated crops accounted for 55 percent of the total value of U.S. crops.[7]
* In 1999, the beverage industry used 12 billion gallons of water to produce $58 billion worth of products.[8]

Water Resource Challenges in the United States and Globally

Water resources in the United States and globally are facing many challenges—both in quality and quantity—due to a number of growing issues, such as population growth, development and climate change. Innovative technologies offerthe promise to address these chal - lenges more cost-effectively and expeditiously.

Water Scarcity: Aquifers are being depleted at a much higher rate than natural precipitation and ground water recharge is refillingthem. As of February 2014, over 36 percent of the continental U.S. is experiencing moderate to severe drought conditions.[9] A fifthof the world's people, more than 1.2 billion, live in areas of physical water scarcity.[10] Some predict that half of the world's population will live with chronic water shortages by the year 2050.[11]

Water Quality: Many of the nation's coastal waters, estuaries, rivers, streams and lakes remain impaired as a result of pollution and/or physical alterations. For example, according to the 2008–2009 EPA National Rivers and Streams Assessment (NRSA), 55 percent of the nation's river and stream miles do not support healthy populations of aquatic life, with phosphorus and nitrogen pollution being just one of the problems.[13] Increases in population and land development present additional challenges such as increased storm-water runofffrom impervious surfaces. Declining source water quality poses challenges for conventional water treatment plants in meeting drinking water standards.

Aging Infrastructure: America's water and wastewater infrastructure is aging. The American Society of Civil Engineers gives the current water and wastewater

> "Water is an essential commodity: human life—and indeed all life on earth—depends upon it. Water is also a critical input to production in a number of economic sectors....Every sector of the economy is influenced in some way by water."
>
> — From EPA's *The Importance of Water to the U.S. Economy Synthesis Report,* 2013[13]

infrastructure a grade of "D."[14] There are an estimated 240,000 water main breaks per year in the United States. Assuming every broken pipe needs replacing, the cost over the coming decades could exceed $1 trillion.[15] Wastewater systems experience approximately 75,000 sanitary sewer overflowsannually, discharging 3 to 10 billion gallons of untreated wastewater, leading to some 5,500 illnesses due to exposures to contaminated recreational waters.[16] Estimates of costs for wastewater and stormwater needs exceed $298 billion,[17] while drinking water needs exceed $384 billion[18] over the next 20 years.

Climate Change Impacts: Climate change is exacerbating the challenge of protecting water resources, ecosystems and our water infrastructure. According to the EPA *National Water Program 2012 Strategy: Response to Climate Change,* the negative impacts on water resources take a variety of forms. Warmer air, warmer water and changes in precipitation patterns increase water pollution problems. More extreme weather events (e.g., flooding)can have devastating impacts on water and wastewater infrastructure and aquatic systems. Rising sea levels will alter ocean and estuarine shorelines, and the increased frequency, severity and duration of drought will affectpublic water supply, agriculture, industry and energy production uses. Warmer water and changing flowsalter aquatic biology. Many, or all, of these things combine to change the availability of drinking water.[19]

> "During the next 10 years, many countries important to the United States will experience water problems—shortages, poor water quality, or floods—that will risk instability and state failure, increase regional tensions, and distract them from working with the United States on important US policy objectives."
>
> —From the National Intelligence Council's *Global Water Security,* 2012[20]

Access to Water and Sanitation: About 783 million people worldwide do not have reasonable access to clean and safe water for consumption, and about 2.5 billion do not have access to basic sanitation.[21]

Tools to Assess Water Supply Risk and Vulnerability

A variety of tools has been developed for use by companies, utilities, planners and others to assess current and future water risks. With a greater understanding of the risks, these players then often seek technical or institutional innovation. Some examples of tools that address either water availability and/or water quality risks include:

> "In communities all around the world, water supplies are coming under increasing pressure as population growth, climate change, pollution, and changes in land use affectwater quantity and quality."
>
> —From the National Academy of Sciences' *Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater,* 2012[22]

* **Global Water Tool (World Business Council for Sustainable Development)**— Designed for companies and organizations to map their water use and then assess risks relative to their global operations and supply chains.
* **Aqua Gauge (Ceres)**—A way for companies to assess, improve and communicate their corporate-wide water risk management approach.
* **Watersketch Toolbox (Finnish Environment Institute)**— Offersinformation and practical tools and methods for sustainable river basin planning and management.
* **Local Water Tool (GEMI)**— Intended for companies and organizations to evaluate the external impacts, business risks, opportunities and management plans related to water use and discharge at a specificsite or operation.
* **CREAT, Climate Resilience Evaluation and Awareness Tool (EPA)**—Organizes available climate data and guides users through a process of identifying threats, vulnerable assets and adaptation options to reduce risk.
* **Aqueduct Water Risk Atlas (World Resources Institute)**— Intended for companies, investors, governments and communities to better understand where and how water risks are emerging around the world.
* **Sea Level Rise Tool For Sandy Recovery (NOAA)**— Provides a set of map services to help communities, residents, and other stakeholders consider risks from future sea level rise in planning for reconstruction following Hurricane Sandy.

An inventory of other water tools and their use, as well as other information, is available at http://water.epa.gov/infrastructure/watersecurity/techtools/index.cfm .

Market Opportunities for Technology and Institutional Innovation

Our water resource and sustainability issues represent market opportunities for technology and institutional innovation and to promote economic growth. Descriptions of the most pressing needs and promising opportunities are outlined below.

1. Conserving and Recovering Energy

Much of the country's water and wastewater infrastructure was constructed at a time when energy costs were low; therefore little was invested in energy efficiency or energy generation. Similarly, traditional agricultural practices could take advantage of opportunities for energy savings (e.g., more efficient drip irrigation systems) and nutrient recovery. Energy conservation and recovery in the water and agriculture sectors have significant promise:

* Approximately 2 percent of the nation's total energy consumption, (69.4 billion kilowatt-hours) is used for drinking water and wastewater treatment services.[23]
* Wastewater treatment plants have an estimated 400 megawatts (MW) of biogas-based electricity generating capacity and approximately 38,000 million Btu per day of thermal energy generating capacity.[24]
* AgSTAR estimates that there are 8,200 U.S. dairy and swine operations that could support biogas recovery systems, collectively able to generate more than 13 million MWh per year and displace about 1,670 MW of fossil-fuel-fired generation.[26]

> "The US has the potential to realize the benefits of advanced water and wastewater strategies on a national scale. Achieving this, however, will require engaging engineering, financial, and political leadership to crystallize an actionable national water agenda, strengthen the mechanisms that mitigate sector fragmentation and deliver a supportive policy framework."
>
> —From Ernst and Young's *The US Water Sector on the Verge of Transformation*, 2013[25]

*** Technology Innovation Challenge and Aspiration:**

Imagine a future when water, wastewater and agricultural activities can cost-effectively generate as much energy as they consume!

2. Recovering Nutrients

Excess nitrogen and phosphorus is one of the leading causes of water pollution across the nation.[27] Point sources (e.g., municipal wastewater treatment facilities,

Innovation Highlight: Utility Harnesses Hydropower

The Massachusetts Water Resources Authority (MWRA) harnesses energy via an in-line hydroelectric turbine and generator. The hydroelectric system extracts the kinetic energy of potable water as it travels down-gradient from the treatment plant to a network of tanks. MWRA's system has a capacity of 200 kilowatts, of which 25 percent is used onsite by the utility and 75 percent is exported back to the grid. More information can be found at http://www.mwra.state.ma.us/05energy/pdf/2012/011812-energystaffsummary.pdf .

Innovation Highlight: Dairy Farm Goes Energy Positive

Brubaker Farm, a 900-head dairy in Lancaster Country, Pennsylvania, captures methane from manure digestion and produces electricity to provide power to the farm and sell excess back to the grid, enough to power 150–200 homes. Waste heat from the generator heats water for the farm and is used to dry digested solids for bedding for cow comfort. More information can be found at http://www.usdairy.com/~/media/usd/public/brubakercasestudy.ashx .

Innovation Highlight: Utility Extracts Nutrients from Wastewater

The Hampton Roads Sanitation District (HRSD) Struvite Recovery Facility in Virginia recovers phosphorus from wastewater recycle streams. The recovered phosphorus is transformed at HRSD's Nansemond facility into a commercial fertilizer. More information can be found at http://www.ostara.com/sites/default/files/Ostara-Hampton-Roads-Case-Study.pdf .

concentrated animal feeding operations) and nonpoint sources (e.g., agricultural activities, urban stormwater runoff,septic systems) contribute to nutrient pollution of surface and ground water. Approximately 14,000 water bodies are affectedby nutrient pollution throughout the United States.[28] Every state in the U.S. has nutrient-impaired waters that have the potential for serious health and ecological effects(e.g., harmful algal blooms, oxygen dead zones, unhealthy drinking water).[29]

Nutrient treatment and recovery technologies are being used at muncipal wastewater treatment plants, but implementation has been slow due to complexities in deployment, high energy use, and overall high costs. New techniques are needed to reduce and recover nutrients at substantially less cost and with a reduced carbon footprint.

Technology Innovation Challenge and Aspiration:

Imagine if we could recover nutrients from human and animal wastes and convert them into marketable commodities before they negatively impact surface and ground water!

3. Improving and Greening of the Water Infrastructure

There is a critical need to rehabilitate the nation's water and wastewater infrastructure, the costs of which are estimated at $682 billion ($384 billion for drinking water infrastructure[30] and $298 billion for wastewater and stormwater infrastructure[31]). There is an expanding array of technologies and techniques available for assessing,

Innovation Highlight: The Greening of Our Cities

Philadelphia established the Green City Clean Waters program in 2010. The city has removed 10,000 square feet of impervious paving and has begun installation of green street blocks throughout the city. Sixteen green school projects have been completed and private businesses are now engaged in approximately 300 greening projects. The city also has an incentive program for stormwater billing that grants a nearly 100 percent credit for green retrofits.More information can be found at http://www.phillywatersheds.org/what_were_doing/documents_and_data/cso_long_term_control_plan .

Onondaga County and the city of Syracuse's "Save the Rain" campaign began in 2009 and is a comprehensive plan to clean up and restore Onondaga Lake and its tributaries, including a strong outreach effort to educate the general public on ways to lessen the overflowof sewage into Onondaga Lake. The program includes construction of innovative gray and green infrastructure, including the War Memorial Arena, with a 15,000-gallon cistern system, the firstsystem in the country designed to use harvested rainwater for a hockey rink. One of the key elements of Save the Rain is transparency. Every project advanced through the program has a unique Web page where the public can review the project design elements, cost and stormwater capture objectives. More information can be found at http://savetherain.us/ .

rehabilitating and retrofittingwastewater, drinking water and stormwater infrastructure.

Green infrastructure, referred to by some as blue-green infrastructure or natural Infrastructure, is based on the principles of natural systems to build or rebuild our infrastructure to achieve an array of objectives such as stormwater management, improved water reuse, climate adaptation and resilience, improved habitat and biodiversity, less heat stress, improved air quality, and greater aesthetic value.

Technology Innovation Challenge and Aspiration:

Imagine if we could vastly expand the use of green and natural infrastructure to improve the nation's water infrastructure while also achieving a broad array of environmental, social and economic benefitsby designing with nature in our urban environments!

4. Conserving and Eventually Reusing Water

Competition for water resources and diminished resources because of drought are driving the need for water conservation, efficiency, and reuse. In order to create a more sustainable water future, cities and states are encouraging water conservation as a way to reduce demand. Water reuse technologies have also been implemented in numerous locations in the United States and throughout the world. For example, Israel reuses 70 percent of its domestic wastewater.[32]

Innovation Highlight: The World's Largest Potable Reuse System

The Ground Water Replenishment System (GWRS), operated by the Orange County Water District, is the world's largest planned indirect potable reuse project. The system recycles treated wastewater from the Orange County Sanitation District using a three-step purification process to produce a near-distilled-quality water that exceeds all state and federal drinking water standards. Operational since January 2008, this state-of-the-art water purification project produces 70 million gallons per day, which is enough water to meet the needs of nearly 600,000 residents in north and central Orange County, California. Each day, approximately 35 million gallons of the GWRS water are pumped into injection wells to create a seawater intrusion barrier, and another 35 million gallons are pumped into the district's percolation basins in Anaheim, where the water naturally filters through sand and gravel to the deep aquifers of the ground water basin. More information can be found at: http://www.gwrsystem.com/the-process.html .

Innovation Resource: EPA WaterSense Program Saves Water

WaterSense, a partnership program by EPA, is helping to sustain and protect the nation's water supply by fostering the development and use of water-efficient products, new homes and services. WaterSense brings together a variety of stakeholders to promote the value of water efficiency, encourage innovation in manufacturing, and decrease water use and reduce strain on water resources and infrastructure. More information can be found at http://www.epa.gov/watersense/index.html .

In light of growing populations and climate change, conserving water can help communities meet future needs. Many technologies exist to help consumers save water in the home and office. In addition, with the need for water infrastructure upgrades and replacements estimated at hundreds of billions of dollars, technologies that help water utilities reduce water loss, fix leaks and prioritize main replacement not only improve water efficiency but can also mitigate some portion of those costly infrastructure needs.

Technologies currently exist to provide treatment for varying levels of water reuse such as irrigation, industrial use, gray water applications, and indirect and direct potable reuse. There is a vast potential for additional technology development and application to conserve and reuse water resources. The nation's 15,000 municipal wastewater facilities discharge approximately 32 billion gallons of water every day.[33] Water reuse and repurposing can serve to reduce pressure on other sources of fresh water, such as ground water (which 44 percent of the population depends on for drinking water).[34]

*** Technology Innovation Challenge and Aspiration:**

Imagine if we could increase water reuse to support the water needs of our burgeoning population!

5. Reducing Costs and Improving Techniques for Water Monitoring

Newer monitoring technologies, such as improved water quality sensor technology, remote sensing and satellite imagery, hold opportunities to generate substantially more data at lower cost. New sensor technology coupled with improved telemetry and information technology can make data on water quantity and water quality available for a broader range of applications. Sensor and laboratory advances also provide opportunity for reducing the overall cost of water quality monitoring. New tools are being developed to store, communicate, analyze and visualize the vast data streams. Currently, less than 30 percent of the nation's surface water bodies are assessed by EPA, states or tribes, partly because of the high cost of traditional fixed-station water quality monitoring.

*** Technology Innovation Challenge and Aspiration:**

Imagine collaborative monitoring efforts that provide low-cost, watershed-scale, real-time data on water quality and quantity that facilitate protection and wise use of our water resources!

Innovation Highlight: Proliferation of Remote/Continuous Monitoring

The National Great Rivers Research and Education Center (NGRREC) is working to create a network of monitoring buoys for real-time, continuous water quality data on the Mississippi, Missouri and Illinois Rivers. More information can be found at http://www.ngrrec.org/ .

Researchers at Clemson University are building the "Intelligent River" to provide real-time monitoring, analysis and management of water resources. More information can be found at http://www.clemson.edu/public/ecology/ .

Wireless Waterway is a project commissioned by the Port of Pittsburgh that will use the latest monitoring and information technology to manage the water resources in real time so commerce and recreation along the Pittsburgh Waterfront are easier for everyone. More information can be found at https://www.wirelesswaterways.com/ .

The JeffersonProject is a collaborative effortbetween Rensselaer Polytechnic Institute, IBM and the FUND for Lake George (New York) to develop a lake environmental monitoring and prediction system to provide a real-time understanding of lake health. More information can be found at http://fundforlakegeorge.org/solutions/the-jefferson-project .

The Hudson River Environmental Conditions Observing System (HRECOS) is a network of real-time monitoring stations on the Hudson River Estuary. HRECOS is a collaborative effortbetween multiple agencies, including the New York State Department of Environmental Conservation, USGS and NOAA, among others. More information can be found at http://www.hrecos.org .

The River and Estuary Observatory Network (REON) is an effortbetween Clarkson University's Beacon Institute for Rivers and Estuaries and IBM to use real-time monitoring technologies to better understand the Hudson River ecosystem from the headwaters in the Adirondack Mountains to the ocean. More information can be found at http://www.bire.org/river-and-estuary-observatory-network/ .

6. Improving Performance of Small Drinking Water Systems

Small drinking water systems consistently provide safe, reliable drinking water to their customers; however, many small systems also face a number of challenges:

* Over 94 percent of the more than 156,000 public water supply systems are small, each serving fewer than 10,000 people.[35]
* In its fifthreport to Congress in 2011, EPA identifieda total infrastructure need of $64.5 billion for small drinking water systems throughout the country.[36]
* Very small drinking water treatment systems (serving fewer than 500 people) have the highest percentage of health-based violations of all system sizes (74 percent).[37]

A 2006 report from EPA's Inspector General[38] identified these challenges as: (1) lack of financialresources, (2) aging infrastructure, (3) difficultiesobtaining financial assistance, (4) cost of scale, (5) management limitations, (6) lack of long-term planning, (7) system operator issues, and (8) challenges with understanding and/or compliance with regulations.

Innovation Highlight: Use of Gray Water as Makeup for Cooling Towers

The Public Service Enterprise Group's Linden Generating Station does not currently employ a cooling water intake structure. Instead, the Linden Generating Station uses reclaimed wastewater from the nearby Linden Roselle Sewerage Authority (LRSA) for all its cooling water needs. Approximately 4 of the 11 million gallons per day of treated wastewater from LRSA is pumped to the Linden Generating Station. After being used for cooling, any remaining water (e.g., cooling tower blowdown) is pumped back to LRSA for treatment again. More information can be found at http://www.pseg.com/info/environment/ps_caring.jsp .

Technology Innovation Challenge and Aspiration:

Imagine the deployment of new cost-effectiveand affordabletechnologies that substantially improve the technical and financialcapacity of small drinking water systems!

Innovation Resource: National Center for Innovation

The EPA Office of Research and Development (ORD) recently sought applications to establish a National Center for Innovation in Small Drinking Water Systems. The Center will research and develop innovative and sustainable technologies and approaches to improve the sustainability of small systems. More information can be found at http://www.epa.gov/ncer/rfa/2013/2013_star_drinkingwater.html.

Innovation Resource: CREAT—A Tool for Improving Resiliency

EPA has developed the Climate Resilience Evaluation and Awareness Tool (CREAT), a software tool to assist drinking water and wastewater utility owners and operators in understanding potential climate change threats and in assessing the related risks at their individual utilities. CREAT provides users with access to the most recent national assessment of climate change impacts for use in considering how these changes will impact utility operations and missions. CREAT allows users to evaluate potential impacts of climate change on their utility and to evaluate adaptation options to address these impacts using both traditional risk assessment and scenario-based decision-making. More information can be found at http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm.

7. Reducing Water Impacts from Energy Production

Vast amounts of water are used each year for energy production in the United States. A considerable amount of water is used to cool thermoelectric power plants, grow feedstock and produce biofuels, and extract oil, coal and natural gas. Further, the polluted water discharges from energy production poses difficult challenges for effective management.

Opportunities exist for innovative solutions to not only alleviate the potential water quality impacts from energy production activities, but also provide for more efficient and cost-effective energy production. For example, beneficial reuse of produced water may be an attractive opportunity for oil and gas production wells located in water-scarce regions, where limited freshwater resources exist and the potential costs for produced water discharge are high.

*** Technology Innovation Challenge and Aspiration:**

Imagine the United States continuing its journey toward securing energy independence without threat to surface or ground water quality and quantity!

8. Improving Resiliency of Water Infrastructure to the Impacts of Climate Change

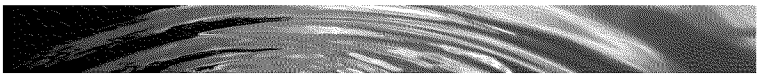
In 2012, Super Storm Sandy affected approximately 60 million people and caused approximately $50 billion in damage, primarily across the Northeast. Affecting

Innovation Highlight: Adapting to Climate Change and Water Reuse

The Emerald Coast Utilities Authority (ECUA) saw its Main Street Wastewater Treatment Plant inundated by Hurricane Ivan in 2004. With the help of funding from FEMA and other sources, the treatment plant was replaced and located outside the city of Pensacola and away from the coastal plain. The Central Water Reclamation Facility was rebuilt using treatment technology that can enable the reuse of 100 percent of the nearly 22.5 million gallons per day (average flow) treated at the facility. More information can be found at http://www.ecua.fl.gov/services/wastewater-services.

Innovation Highlight: Reinventing the Toilet

The Bill and Melinda Gates Foundation challenged universities to design toilets that capture and process human waste without piped water, sewer or electrical connections, while capturing useful resources. The Foundation's Water Sanitation and Hygiene Program strives to spur change to improve worldwide drinking water while reducing sanitation-related problems. More information can be found at http://www.gatesfoundation.org/What-We-Do/Global-Development/Water-Sanitation-and-Hygiene.



Innovation Highlight: Using Roleplaying to Manage Watersheds

The University of Virginia (UVA) Bay Game is a computerized simulation based on the Chesapeake Bay watershed. The watershed simulation allows players to take the roles of stakeholders, such as farmers, developers, watermen and local policy-makers, and make decisions about their watershed. More information can be found at http://www.virginia.edu/vpr/sustain/BayGame/about/ .

more than 690 drinking water and wastewater utilities, it showed how vulnerable our water infrastructure can be to extreme weather/climate events. With almost $600 million of funding provided by Congress, EPA is working with the states of New York and New Jersey to build new, more resilient infrastructure.

On November 1, 2013, President Obama issued an executive order that prompts actions to enhance the nation's preparedness and resilience to extreme events and climate change. The increasing occurrence of extreme events, such as floods, drought and storm surge, underscores the need to utilize new technologies for planning how and where to rebuild existing or build new infrastructure with greater resiliency.

Technology Innovation Challenge and Aspiration:

Imagine if we could protect our water infrastructure from the effects of extreme weather and climate change!

9. Improving Access to Safe Drinking Water and Sanitation

Despite technological advances on many fronts, hundreds of millions of people worldwide still lack access to the most basic of needs—clean drinking water and sanitation facilities.

* In 2011, approximately 768 million people worldwide (more than twice the population of the United States) relied on unimproved drinking water sources with significant threats of contamination. [39]
* At the end of 2011, 2.5 billion people worldwide lacked access to improved sanitation facilities[40] and more people had a mobile-cellular phone subscription than a toilet.[41]

Technology Innovation Challenge and Aspiration:

Imagine if access to safe drinking water and sanitation practices—basic human needs—were no longer responsible for deaths and illness worldwide!

10. Improving Water Quality of Our Oceans, Estuaries and Watersheds

Less than half of the nation's lakes, rivers, streams and coastlines achieve a level of quality to safely allow for their intended uses (e.g., potable water supply, ecosystem protection, swimming, fishing). Similarly, ocean waters and the nation's ground water are also vulnerable to pollution and experiencing impacts from anthropogenic sources.

Because watersheds are defined by natural hydrology, they represent a logical basis for managing water resources. Assessments at watershed levels allow for efficient identification of the types of stressors that affect a watershed, as well as the controls and actions required to protect or restore the water resource.

Innovation in approaches, tools and techniques that can be used to improve and maintain the health of our nation's waters can drastically help address point and nonpoint sources of pollution, help rebuild ecosystems, restore waters, and address threats from invasive species and other impacts.

Technology Innovation Challenge and Aspiration:

Imagine a holistic, integrated watershed-based approach to water quality and water quantity management, which maximizes ecosystem restoration!

Putting It All Together: Achieving Water Sustainability

It is difficultto envision sustainable solutions to our water challenges without technological innovations, such as the distinct opportunities identifiedabove. While these water resource challenges and market opportunities are framed as individual pursuits, ideally, many of these can be achieved in an integrated manner. So, for example, in the case of a traditional municipal wastewater treatment facility, imagine a utility that generates energy; captures nutrients for resource recovery; sells their water for reuse; generates half the volume of biosolids; emits substantially less greenhouse gases; uses green and natural infrastructure to manage stormwater, mitigate climate impacts and provide aesthetic cityscape benefits;and contributes to a comprehensive watershed monitoring program in partnership with a diverse set of partners. Just imagine if we put all of the pieces together!

> "Business has a critical role to play in applying its expertise and experience in developing, implementing and scaling-up, through partnerships, watershed focused solutions."
>
> —From WBCSD's *Sharing Water: Engaging Business*, 2009.[42]

A Path Forward: Actions to Promote Technology Innovation

Our water resource and sustainability issues present significantmarket opportunities for new technology, new thinking and enhanced economic growth. EPA will be a positive contributor with utilities, industry, investors and entrepreneurs to support technology innovation for clean and safe water. Below are example actions EPA will take to support our common quest for water sustainability.

Advocate for Technology Innovation

EPA's National Water Program will be an active advocate for technology innovation.

* The National Water Program will ensure that this issue is a "front and center" topic with our regions and state partners. EPA's National Water Meeting with the regions and states will include a focus on technology innovation and ways the program can foster innovation.
* In April 2012, EPA released its *Technology Innovation for Environmental and Economic Progress: An EPA Roadmap* report (http://www2.epa.gov/envirofinance/innovation). The Roadmap sets out a vision for technology innovation and outlines support strategies for technology development and deployment. The Office of Water will be an active advocate and participant on the Agency Technology Innovation Network.
* The Office of Water will maintain a network list of key EPA innovation contacts (both at headquarters and in regional offices) for each of the market opportunity areas to foster collaboration and coordination within EPA and externally.
* The Office of Water will continue to work with the Office of Research and Development on a number of technology-innovation-related programs and initiatives, including implementation of the Safe and Sustainable Water Research Strategy. For example, the Office of Water will support implementation of the "Nitrogen and Co-pollutant Research Roadmap" to review the Agency's current nutrient research, assess gaps, and prioritize future research directions to reduce nutrient pollution nationwide.
* The Office of Water will support the regional water technology innovation clusters in their effortsto promote technology innovation, including effortsto verify emerging technologies, research and pilot promising technologies, and provide awards to encourage innovation. More information about the exciting effortsof the regional technology clusters can be found at http://www2.epa.gov/clusters-program .

Communicate Actions and Successes

The Office of Water will showcase and celebrate examples of technology innovation aimed at highlighting or solving water resource issues through a website focused on water innovations. The Administrator, Deputy Administrator and other senior leadership within EPA will continue to showcase examples on innovation successes through site visits across the United States.

Create the Regulatory Space to Foster Technology Innovation

There are many barriers to innovation that are often cited (e.g., institutional, cultural, financial,regulatory). EPA will consider ways in which its regulatory activities can reduce barriers to, or encourage incentives for, technology innovation. Following are example actions that EPA will take, in cooperation with our EPA region and state partners:

* Update the Effluent Limitations Guidelines and Standards Program to more explicitly consider sustainable and innovative technologies when developing national standards for controlling water discharges. Stepping back and asking a broad set of questions about the best available technology might include consideration of energy use, sludge generation and disposal, process changes or green chemistry alternatives, water conservation and reuse opportunities, and byproduct and pollutant recovery prospects.
* Explore ways in which NPDES permits could be tailored to foster technology innovation within existing legal

and regulatory authorities. Examples of permitting innovation might include watershed-based permitting, opportunities to foster process optimization or use of existing excess treatment capacity, derivation of long-term average limits for nutrients, opportunities to explore alternative technologies and performance testing of those technologies, or implementation of integrated planning as outlined in the Stoner-Giles memo of June 5, 2012.[43]

* Provide technical support to overcome barriers and allow for the use of innovative technology (e.g., ways to advance "Utility of the Future" concepts). This might include considering energy, carbon sources, greenhouse gas generation, and water and biosolids reuse in a holistic, systems approach.
* Continue to foster and promote consideration and use of green and natural infrastructure to achieve a broad set of environmental, social and economic objectives.
* Participate and contribute to effortsby external parties such as the Water Environment Federation, American Water Works Association and others to explore regulatory and/or policy strategies to identify and overcome barriers to the acceptance of innovative and new technology.
* Continue to collaborate with the Department of Commerce under the Environment and Technology Working Group and Environmental Trade and Technology Advisory Committee in promoting technology-based policies internationally, as well as promoting the environmental technologies exporters' online portal (https://new.export.gov/envirotech/toolkit).

Support for Speeding Delivery of Proven Technologies

The Office of Water will examine ways to address the ongoing challenges expressed by technology developers for bringing new technologies to market. Technology providers face a complex system of state and local requirements that can discourage acceptance, adoption and use of new technologies. For example, by engaging and supporting independent third-party technology evaluation efforts,EPA aims to continue to help bridge the gap between technology development and implementation for water-related technologies. EPA's Office of Water will:

* Evaluate the opportunities to support the growing demand for technology assessment and performance demonstration/verification of a spectrum of water-related technologies (e.g., independent third party).

  Participate in development of the Water Environment Federation (WEF) and Water Environment Research Federation (WERF) Leaders Innovation Forum for Technology, (LIFT), WEF's Stormwater Testing and Evaluation for Products and Practices (STEPP) workgroup, and other promising technology evaluation efforts.

  Coordinate with other domestic and international efforts,including:

  * The Interstate Technology and Regulatory Council (ITRC), a state-led coalition working to advance the use of innovative environmental technologies and approaches.
  * The Water Research Foundation (WRF) has partnered with Isle Inc., an independent consultancy that

Innovation Highlight: Third Party Technology Evaluation

The Water Environment Federation and Water Environment Research Foundation have established LIFT (Leaders Innovation Forum for Technology), a program designed to enable technology evaluations for municipal and industry end-users to share the cost of conducting demonstrations to accelerate adoption of new and innovative technologies. More information can be found at http://www.werf.org/lift.

Innovation Highlight: High-Efficiency Ultraviolet Disinfection System

Several drinking water utilities, together with the Water Research Foundation, are working to pilot a high-efficiencyUV system. The UV system uses a highly reflectivechamber with claims of over 99 percent reflectanceof 254 nm UV generated. The low-pressure UV system will be compared to the existing medium-pressure UV system at the water treatment plant. The research will evaluate the reliability and effectivenessof the technology for Cryptosporidium inactivation, maintenance requirements, and operation and maintenance costs.

Innovation Resource: Potential Funding Opportunities to Support Technology Innovation

There are a number of potential funding and other resources available to assist in the research and development of innovative solutions to water-resource-oriented issues and challenges. Examples include:

Small Business Innovation Research Program (SBIR)—SBIR encourages domestic small businesses to engage in research that has the potential for commercialization. Through a competitive awards-based program, SBIR enables small businesses to develop, and take to market, technologies that help EPA meet its mission of protecting human health and the environment."

Science to Achieve Results (STAR)—STAR is EPA's primary competitive grants program for funding extramural research in environmental science and engineering for universities and nonprofit organizations.

Small Business Technology Transfer (STTR)—STTR expands funding opportunities in the federal innovation R&D arena. Central to the program is expansion of the public/private sector partnership to include the joint venture opportunities for small businesses and nonprofit research institutions.

Clean Water State Revolving Fund (CWSRF)—Under the CWSRF, EPA provides grants or "seed money" to states to capitalize state loan fund programs that provide low-interest-rate loans with flexible terms to fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management.

Strategic Environmental Research and Development Program (SERDP)—SERDP is the Department of Defense's (DOD's) environmental science and technology program, planned and executed in partnership with DOE and EPA, that issues an annual solicitation for proposals from the federal government, academia and industry.

Environmental Security Technology Certification Program (ESTCP)—ESTCP provides funding for the demonstration of environmental technologies pertinent to DOD priorities.

Conservation Innovation Grants (CIG)—CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies, awarding competitive grants to non-federal governmental or nongovernmental organizations, tribes or individuals.

Office of Energy Efficiency and Renewable Energy (EERE) Financial Assistance Programs—Through financial assistance, EERE provides funding for renewable energy and energy efficiency research and development.

Development Innovation Ventures (DIV)—DIV holds a quarterly grant competition for innovative ideas, pilots and tests them using cutting-edge analytical methods, and scales solutions that demonstrate widespread impact and cost-effectiveness.

Additional information related to funding opportunities can be found on the Office of Water Funding and Grants Web page at http://water.epa.gov/grants_funding/home.cfm .

accelerates the market uptake of emerging technologies by introducing them to potentially interested water utilities during the pre-commercial stages of development.

Continue to support efforts such as the Confluence Water Technology Innovation Cluster (http://watercluster.org/wordpress/), where state regulators with Ohio, Kentucky and Indiana recently signed a groundbreaking cooperative agreement that allows the Confluence to work with companies to complete testing that can be approved by all three states at once—dramatically speeding time to market.

* The Office of Water will support EPA's ongoing efforts and programs supporting the development and implementation of innovative water-related technologies, such as the Aging Water Infrastructure Research Program (http://www.epa.gov/awi/) and STAR grants, fellowships and research contracts under the Small Business Innovative Research Program (http://www.epa.gov/ncer/).

Facilitate Financing and Funding Opportunities

EPA recognizes the critical role that funding and financing play to support the development and implementation of technology. Examples of actions EPA's Office of Water will take include:

* Support innovative financing efforts for water, wastewater and stormwater, including green and natural infrastructure.

Innovation Highlight: Utility Goes Energy Positive

More than a decade ago, East Bay Municipal Utilities District (EBMUD) in California began accepting organic wastes from local food processors, food growers and livestock producers to better utilize the excess capacity in its existing anaerobic digesters. The result has been a doubling of biogas production. Along with the revenue generated from tipping fees, the increase in biogas production enabled EBMUD to fund a renewable energy system that generates more power than the facility needs. In 2012, EBMUD's wastewater treatment plant became the first in North America to be a net energy producer. More information can be found at http://www.ebmud.com/water-and-wastewater/environment/wastewater-energy.

Innovation Highlight: Reinventing Urban Water Infrastructure

ReNUWIt is a multi-institution research center for re-inventing the nation's urban water infrastructure, focusing on safe, sustainable urban water infrastructures enabled by technological advances in natural and engineered systems, and informed by a deeper understanding of institutional frameworks. The research center works in close partnership with utilities, water service providers, equipment manufacturers and international research partners to convert great ideas into practical and sustainable solutions. More information can be found at http://renuwit.org/.

* Consider funding of innovative projects that address virus and multiple contaminant treatment at very small drinking water systems.
* Promote public-private partnerships for meeting infrastructure needs.
* Support innovative financing efforts for water, wastewater and stormwater, including green infrastructure. Special consideration will be made for funding of innovative projects that address virus and multiple contaminant treatment at very small drinking water systems.

Partner and Leverage Action with Others

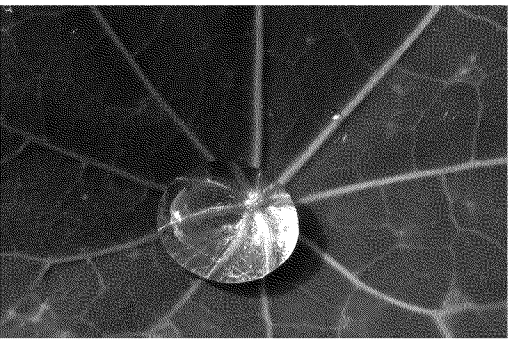
EPA will support a broad spectrum of partners who have a critical role in fostering technology innovation, including, for example:

* **Partner with States and Tribes:** The EPA Office of Water will work closely with our state and tribal partners on steps to foster technology innovation, including ways to offer regulatory flexibilities for innovation and reciprocity for technology assessment and verification.
* **Partner with Other Federal Agencies:** EPA will work with other federal agencies to leverage resources to support innovative technology. For example, EPA is partnering with the Department of Energy to leverage opportunities to advance innovation in the water-energy nexus space.
* **Support Partnership Agreements and Memoranda of Understanding (MOUs) for Innovation:** The EPA has the ability to enter into partnership agreements and MOUs that foster innovation. As an example, EPA joined the Partnership on Technology Innovation and the Environment in 2012 to accelerate the development, adoption, deployment and export of technologies that protect health and the environment while growing the economy and creating jobs.[44] Also, EPA has recently established an MOU with Imagine H2O to identify and foster innovative water technologies that show promise, if implemented, in developing sustainable water supplies and watersheds.[45]
* **Support Water Technology Innovation Clusters:** EPA's Office of Research and Development has the lead for supporting and networking with other water technology clusters. EPA's National Water Program will also remain active and help communicate the efforts and accomplishments of the clusters and work in collaboration with research and the cluster leaders.
* **Assess the Science of Remote Sensors and Emerging Watershed Monitoring Networks:** EPA will work with the U.S. Geological Survey, NASA and other partners to assess the state of the science of remote sensors and remote sensing technology and the capability of emerging watershed-based monitoring networks to provide real-time water information.

* **Promote Integrated Watershed Monitoring Networks:** The EPA Office of Water will explore partnerships with the business community, watershed groups and others to build water quality and water quantity monitoring data systems to organize information on and characterize on a watershed scale.
* **Contribute to Third Party Dialogues:** External partners have played a crucial role in convening discussions among a broad range of stakeholder groups to explore and pursue different aspects of water technology and sustainability. For example, as part of their Charting New Waters Initiative, the Johnson Foundation at Wingspread has convened key experts on several emerging water issues. EPA will actively engage in these kinds of progressive dialogues that include balanced and diverse representation.
* **Support Export Programs and Increase Demand and Market Opportunities for U.S. Technologies and Services:** EPA with other federal agencies (e.g., Department of Commerce and the U.S. Trade Development Agency) will continue to advance economic development in partner countries by providing technical assistance and capacity building that supports legal and regulatory reform related to commercial activities and infrastructure development, establishing industry standards, and participating in other market-opening activities. These technical assistance programs facilitate favorable business and trade environments for U.S. goods and services.

Support Research, Development, and Demonstration Projects

The EPA Office of Water will continue to support research, development and deployment of technologies to support and address the water challenges articulated above. The EPA Office of Water will also support continued grants to early stage companies through its own and through Small Business Innovation Research.



A Cross Section of Views and Actions About Innovation in the Water Sphere

Since the release of the March 2013 "Blueprint,"EPA has continued to engage with a broad cross section of utility, business, investment, and academic leaders and practitioners to understand the dynamics and opportunities that restrain or foster the pursuit of technology innovation. We clearly recognize that there are direct roles and activities that EPA's National Water Program can engage in. Just as importantly, there are crucial roles that others can take, including states, utilities, the private sector, NGOs and citizens. The following is a short sampling of examples and perspectives from various sources on the technology innovation landscape that have helped to shape this document and inform the actions that EPA will take. These are just examples.

* **American Water Summit—Accelerating Change:** On November 5–6, 2013, over 300 attendees representing diverse interests including public and private utilities, financeand investors, consultants, and others partic - ipated in discussions related to driving performance, promoting the value of water, creating new financial models and incentives for investment, and recognizing water as a driver for economic growth.
* **Water Environment Federation (WEF) CEO Roundtable (2012):** On October 1, 2012, WEF convened a discussion with 16 CEOs and then Administrator Lisa Jackson and Acting Water Assistant Administrator Nancy Stoner. They identifiedfour key needs for innovation: (1) promoting public-private partnerships, (2) technology evaluation and sharing of performance data, (3) willingness among regulatory agencies and utilities to take greater risks to support pursuit of innovation, and (4) better communication and education of the public.
* **Utility of the Future:** In 2013, the National Association of Clean Water Agencies (NACWA), in collaboration with the Water Environment Research Foundation (WERF) and WEF, released *The Water Resources Utility of the Future…A Blueprint for Action.* Among other things, these organizations have fundamentally redefinedthe business case and role for the traditional "wastewater treatment utility" to one that emphasizes resource recovery (water, nutrients and energy).
* **U.S. Water Alliance:** The U.S. Water Alliance has been a key catalyst for fostering and demonstrating innovation and water sustainability through their annual "One Water Leadership Summit" and "U.S. Water Prize."Their quest for a national water vision with "one water" at its core has led to roundtables and workshops among diverse stakeholders and decision-makers, emphasizing the value of water and the urgency of integration and leadership at multiple levels
* **U.S. and World Business Council:** The U.S. and World Business Council for Sustainable Development (USBCSD and WBCSD) have been key innovation catalysts in the business community. They have convened critical dialogues and issued key papers (i.e., "Water: Facts and Trends,""Water Valuation, Building the Business Case," and "Sharing Water: Engaging Business") that encourage businesses to engage in water valuation practices and become involved in the equation of healthy watershed management.
* **The Water Research Foundation** published *Water Quality Impacts of Extreme Weather-Related Events* in 2014. Based on actual utility case-studies, the report outlines actionable steps water utilities can take to prepare for changing weather patterns.
* **The American Water Works Association,** in its 2013 *State of the Water Industry Report,* highlights the challenges and opportunities faced by the water sector as assessed by experts at utilities, in government and among manufacturers.
* **Regional Technology Clusters:** Regional water technology innovation clusters exist in various locations across the United States (and internationally). They include interconnected firms,supporting institutions, local governments, business chambers, universities, investors and others that work together in a particular geographic area to promote economic growth and technological innovation. Clusters foster collaboration between many differentgroups and provide a variety of advantages in developing innovative technologies that build on the geographic area's strengths and interests. Several formal and emerging clusters exist. More information can be found at http://www2.epa.gov/clusters-program .

For More Information

Please visit http://www2.epa.gov/innovation/watertech for more information about technology innovation in the water sphere and for an electronic version of this document.

EPA welcomes discussion, comments and feedback. Comments can be directed to Jeff Lape, Deputy Director, Office of Science and Technology, Office of Water, U.S. EPA, MC-4301T, 1200 Pennsylvania Avenue, Washington DC 20460. Jeff's email is lape.jeff@epa.gov and his phone is (202) 566-0480.

"Innovative technology can play a significant role in solving many of the water-related problems facing the U.S. and also providing opportunities for economic development. The preponderance of evidence demonstrates that environmental protection and economic progress go hand-in-hand. President Obama said that the U.S. will win the future by out educating, out innovating, and out building competitors."

—From EPA's *Fiscal Year 2014 National Water Program Guidance,* 2013

References and Endnotes

[1] Kiparsky, M., Sedlak, D., Thompson, B.H., Truffle B. 2013. The Innovation Deficit in Urban Water: The Need for an Integrated Perspective on Institutions, Organizations and Technology. *Environmental Engineering Science,* Volume 30, Number 8.

[2] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 1. <http://www.tech-strategy.com/pdf/Winter2013.pdf > (accessed September 18, 2013).

[3] USGS. 2009. *Estimated Use of Water in the United States in 2005.* USGS Circular 1344. <http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf> (accessed February 24, 2014)

[4] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 19. <http://www.tech-strategy.com/pdf/Winter2013.pdf > (accessed September 18, 2013).

[5] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 18. <http://www.tech-strategy.com/pdf/Winter2013.pdf > (accessed September 18, 2013).

[6] American Sportfishing Association. 2013. *Sportfishing in America.* <http://asafishing.org/uploads/2011_ASASportfishing_in_America_Report_January_2013.pdf > (accessed September 18, 2013)

[7] USDA Economic Research Service. 2013. Irrigation & Water Use: Background. <http://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/background.aspx >

[8] EPA Office of Water. 2000. *Liquid Assets 2000: America's Water Resources at a Turning Point.* Page 2. <http://water.epa.gov/scitech/swguidance/standards/upload/assets_2000.pdf > (accessed September 18, 2013)

[9] National Drought Mitigation Center. 2014. Western U.S. Still in Grips of Drought in February 2014. <http://drought.unl.edu/NewsOutreach/MonthlySummary/February2014DroughtandImpactSummary.aspx > (accessed March 10, 2014)

[10] Comprehensive Assessment of Water Management in Agriculture. 2007. *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture.* London: Earthscan, and Colombo: International Water Management Institute. <http://www.iwmi.cgiar.org/assessment/files_new/synthesis/SummarySynthesisBook.pdf >

[11] The Economic Times. 2011. Half of World Population to Struggle for Water in 2050. <http://articles.economictimes.indiatimes.com/2011-01-17/news/28431152_1_fresh-water-ground-water-water-bodies> (accessed March 10, 2014)

[12] EPA. 2013. *The National Rivers and Streams Assessment 2008–2009: A Collaborative Survey.* EPA 841-F-13-004. <http://water.epa.gov/type/rsl/monitoring/riverssurvey/upload/NRSA200809_Fact-Sheet_Report_508Compliant_130225.pdf >

[13] EPA Office of Water. 2013. *The Importance of Water to the U.S. Economy: Synthesis Report.* Page 13. <http://water.epa.gov/action/importanceofwater/upload/Importance-of-Water-Synthesis-Report.pdf> (accessed November 21, 2013)

[14] American Society of Civil Engineers. 2013. *2013 Report Card for America's Infrastructure.* <http://www.infrastructurereportcard.org/> (accessed February 24, 2014)

[15] American Society of Civil Engineers. 2013. Drinking Water. In *2013 Report Card for America's Infrastructure.* <http://www.infrastructurereportcard.org/a/#p/drinking-water/overview > (accessed March 10, 2014)

[16] EPA. 2013. Aging Water Infrastructure. <http://www.epa.gov/scienceматters/april2010/scinews_aging-water-infastructure.htm > (accessed September 18, 2013).

[17] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* Page 2-4. <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf > (accessed September 18, 2013)

[18] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf > (accessed March 10, 2014)

[19] EPA. 2014. 2012 National Water Program Strategy. <http://water.epa.gov/scitech/climatechange/2012-National-Water-Program-Strategy.cfm> (accessed September 18, 2013)

[20] National Intelligence Council. 2013. *Global Water Security.* Intelligence Community Assessment ICA 2012-08. <http://www.dni.gov/files/documents/Special%20Report_ICA%20Global%20Water%20Security.pdf >

[21] World Health Organization and UNICEF. 2013. *Progress on Sanitation and Drinking-Water: 2013 Update.* <http://apps.who.int/iris/bitstream/10665/81245/1/9789241505390_eng.pdf > (accessed September 18, 2013)

[22] National Research Council, National Academy of Sciences. 2012. *Understanding Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater.*

[23] Electric Power Research Institute and Water Research Foundation. 2013. *Electricity Use and Management in the Municipal Water Supply and Wastewater Industries.* <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002001433 >

[24] EPA Combined Heat and Power Partnership. 2011. *Opportunities for Combined Heat and Power at Wastewater Treatment Facilities: Market Analysis and Lessons from the Field.* <http://www.epa.gov/chp/documents/wwtf_opportunities.pdf > (accessed September 18, 2013)

[25] Ernst and Young. 2013. *The US Water Sector on the Verge of Transformation: Global Cleantech Center White Paper.* <http://www.ey.com/Publication/vwLUAssets/Cleantech_Water_Whitepaper/$FILE/Cleantech-Water-Whitepaper.pdf > (accessed September 18, 2013)

[26] EPA. 2014. Market Opportunities for Biogas Recovery Systems. <http://www.epa.gov/agstar/tools/market-oppt.html > (accessed September 18, 2013)

[27] EPA. 2014. National Summary of State Information. <http://ofm-pub.epa.gov/waters10/attains_nation_cy.control > (accessed February 24, 2014).

[28] State-EPA Nutrient Innovations Task Group. 2009. An Urgent Call to Action: Report of the State-EPA Nutrient Innovations Task Group. <http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/2009_08_27_criteria_nutrient_nitgreport.pdf > (accessed September 18, 2013)

[29] EPA Office of Inspector General. 2009. *EPA Needs to Accelerate Adoption of Numeric Nutrient Water Quality Standards.* <http://www.epa.gov/oig/reports/2009/20090826-09-P-0223.pdf > (accessed September 18, 2013)

[30] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf > (accessed March 10, 2014)

[31] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf > (accessed September 18, 2013)

[32] Stutz, E. 2010. Israel: World Leader in Recycled Water. <http://www.israelnationalnews.com/ >

[33] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* Appendix I, Page I-5. <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf > (accessed September 18, 2013)

[34] National Ground Water Association. 2010. Groundwater Facts. <http://www.ngwa.org/Fundamentals/use/Pages/Groundwater-facts.aspx > (accessed January 23, 2014)

[35] EPA. 2012. Water: Small Systems and Capacity Development: Basic Information. <http://water.epa.gov/type/drink/pws/smallsystems/basicinformation.cfm > (accessed September 18, 2013)

[36] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf > (accessed September 18, 2013)

[37] EPA. 2011. *National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People.* <http://water.epa.gov/type/drink/pws/smallsystems/upload/REVFINAL-Nat-Characte-July-2011-508-compliant.pdf > (accessed September 18, 2013)

[38] EPA Office of Inspector General. 2006. *Much Effort and Resources Needed to Help Small Drinking Water Systems Overcome Challenges.* Report No. 2006-P-00026. <http://www.epa.gov/oig/reports/2006/20060530-2006-P-00026.pdf >

[39] World Health Organization and UNICEF. 2013. *Progress on Sanitation and Drinking-Water: 2013 Update.* <http://apps.who.int/iris/bitstream/10665/81245/1/9789241505390_eng.pdf > (accessed September 18, 2013)

[40] Ibid.

[41] Water.org. 2014. Millions Lack Safe Water. <http://water.org/water-crisis/water-facts/water/ > (accessed September 18, 2013)

[42] World Business Council for Sustainable Development. 2009. *Sharing Water: Engaging Business.* <http://www.wbcsd.org/sharingwaterengagingbusiness.aspx > (accessed September 18, 2013)

[43] EPA. 2013. Integrated Municipal Stormwater and Wastewater Plans. <http://cfpub.epa.gov/npdes/integratedplans.cfm > (accessed September 18, 2013)

[44] The Partnership is a voluntary collaborative committed to accelerating the development, adoption, deployment and export of technologies that protect human health and the environment while growing the U.S. economy and creating American jobs. In addition to EPA, members of the Partnership currently include the Nicholas Institute for Environmental Policy Solutions (Duke University), the Center for Environmental Policy (American University), the Environmental Defense Fund, and others.

[45] Imagine H2O is a nonprofitorganization that supports entrepreneurship in the water sector for people to address and potentially solve water problems. Imagine conducts an annual competition that awards a business plan prize ("the Prize") to selected water entrepreneurs whose technologies show promise in addressing various water-related environmental problems.

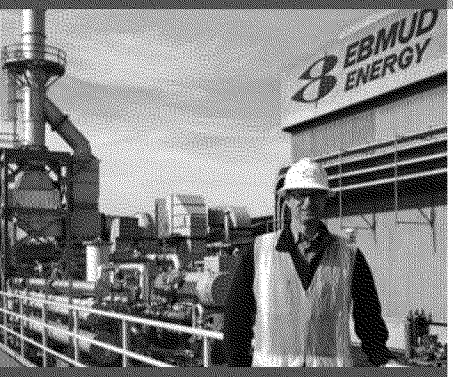
U.S. Environmental Protection Agency
Office of Water

http://www2.epa.gov/innovation/watertech

Office of Water April 2014 EPA 820-F-14-007

Promoting Technology Innovation for Clean and Safe Water

Water Technology Innovation Blueprint – Version 2



Energy from Wastewater

In 2012, the East Bay Municipal Utility District became the first water resource recovery facility in North America to produce more renewable energy on site than is needed to run its facility.

Nutrient Recovery and Reuse

The Hampton Roads Sanitation District uses a new and innovative green technology from Ostara Nutrient Recovery Technologies, known as the Pearl® Process, to recover phosphorus and nitrogen to create a slow-release fertilizer, Crystal Green®.

Our freshwater resources are limited and face mounting pressures from drought, flooding, pollution, population growth, an aging water infrastructure and competition for many uses (e.g., ecosystem protection, drinking water, agriculture, energy production, recreation). Technology innovation can help address our water challenges and help put us on a more sustainable path while also supporting economic growth. The U.S. Environmental Protection Agency (EPA) aims to be a catalyst to promote and support technology innovation to restore, protect and ensure the sustainability of our water resources. EPA's Office of Water has issued *Promoting Technology Innovation for Clean and Safe Water* to build on its March 2013 *Blueprint for Integrating Technology Innovation into the National Water Program.* This Technology Innovation Blueprint (Version 2) frames the business case for water technology innovation, highlights examples of innovation pioneers, and frames a robust set of actions that EPA will take to promote technology innovation for clean and safe water. See the document at http://www2.epa.gov/innovation/watertech .

> "Every American deserves clean and safe water; we will achieve that goal by supporting the advancement and use of innovative technologies to meet challenges and seize opportunities in the water sector."
>
> —EPA Administrator Gina McCarthy

Extraordinary Challenges Require Innovative Solutions

The world faces significant water resource issues that must be addressed:

- Extreme weather events caused by climate change severely impact water and wastewater infrastructure.
- Increased frequency, severity and duration of drought strains drinking water supplies and hurts the economy.
- Significant portions of the world's population still do not have access to clean water and adequate sanitation.
- Many rivers, streams, lakes, oceans and ground waters are severely polluted, diminishing their benefits for people and ecosystems.
- Aging water infrastructure with estimated needs of greater than $600 billion.

> "Technology innovation can accelerate progress toward our goals of clean and safe water. EPA and many stakeholders will strive to support technology innovation to solve water resource problems…cheaper, faster and using less energy!"
>
> —EPA Acting Assistant Administrator for Water Nancy Stoner

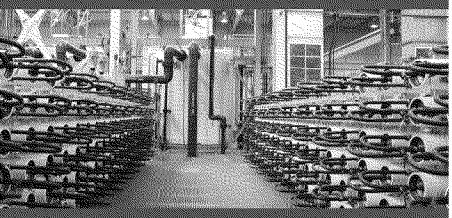
Vital for Water Sustainability

Sustainability creates and maintains the conditions under which humans and nature can exist in productive harmony. It allows us to fulfill the social, economic and other requirements of present as well as future generations. To achieve water sustainability, technological innovations as well as social and institutional changes will be needed. See EPA's sustainability webpage at http://www.epa.gov/sustainability for more information.

For more information: http://www2.epa.gov/innovation/watertech

Greening Our Cities

Green City, Clean Waters is Philadelphia's 25-year plan to protect and enhance their watersheds by managing stormwater with intensely implemented green infrastructure. Save the Rain is Onondaga County's and the city of Syracuse's visionary stormwater management and outreach program, featuring over 100 projects, capturing over 100 million gallons of runoff each year to protect their watershed.



Potable Water from Wastewater

The Ground Water Replenishment System operated by the Orange County Water District is the world's largest advanced water purification system for potable reuse, taking treated wastewater that is purified to produce a high-quality water.

Improving Water Monitoring

The Hudson River Environmental Conditions Observing System (HRECOS) and River and Estuary Observatory Network (REON) monitoring networks provide real-time data and information that can be used to more efficiently manage the Hudson River watershed.

Opportunities for Water Technology Innovation

Conserving and recovering energy—Imagine a future when water, wastewater and agricultural activities can cost-effectively generate as much energy as they consume.

Recovering nutrients—Imagine if we could recover nutrients from human and animal wastes and convert them into marketable commodities before they negatively impact surface and ground water.

Improving and greening of the water infrastructure—Imagine if we could vastly expand the use of green and natural infrastructure to improve the nation's water infrastructure while also achieving a broad array of environmental, social and economic benefits.

Conserving and eventually reusing water—Imagine if we could increase water reuse to support the water needs of our burgeoning population.

Reducing costs and improving techniques for water monitoring—Imagine collaborative monitoring efforts that provide low-cost, watershed-scale, real-time data on water quality and quantity that facilitate protection and wise use of our water resources.

Improving performance of small drinking water systems—Imagine the deployment of new cost-effective and affordable technologies that substantially improve the technical and financial capacity of small drinking water systems.

Reducing impacts from energy production—Imagine the United States continuing its journey toward securing energy independence without threat to surface or ground water quality and quantity.

Improving resiliency of water infrastructure to the impacts of climate change—Imagine if we could protect our water infrastructure from the effects of extreme weather and climate change.

Improving access to safe drinking water and sanitation—Imagine if access to safe drinking water and sanitation practices—basic human needs—were no longer responsible for deaths and illness worldwide.

Improving water quality of our oceans, estuaries and watersheds—Imagine a holistic, integrated watershed-based approach to water quality and water quantity management, which maximizes ecosystem restoration.

Taking Action to Promote Technology Innovation

The EPA Office of Water will be a positive contributor with utilities, industry, investors and entrepreneurs to support technology innovation for clean and safe water. Example actions that EPA will take to support and foster innovation include:

- Advocate for technology innovation
- Communicate technology innovation actions and successes
- Create the regulatory space to foster technology innovation
- Support assessment and delivery of proven technologies
- Facilitate financing and funding opportunities
- Partner and leverage action with others
- Support research, development and demonstration projects

For more information: http://www2.epa.gov/innovation/watertech

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]
Cc: Penman, Crystal[Penman.Crystal@epa.gov]
From: Tarquinio, Ellen
Sent: Mon 4/7/2014 7:06:52 PM
Subject: For Review: OW Cabinet Report
OW Weekly Administrator April 14 2014.docx

Hi Nancy

Attached please find new items OW's submittal for this week's cabinet report, covering items scheduled to occur next week and forecasting the next 30 days. You'll notice at the bottom of the document is the entry for 316(b). I'm hoping for some guidance on the date to use for this entry.

As an FYI, I'll also send any new OW related items that have been submitted under the regions in a separate document Thursday.

Please let me know if you have any questions or comments.

Thanks!

Ellen

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3320

202-566-2267

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Zipf, Lynn[Zipf.Lynn@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Matuszko, Jan[Matuszko.Jan@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]; Levine, MaryEllen[levine.maryellen@epa.gov]; Witt, Richard[Witt.Richard@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]
From: Wood, Robert
Sent: Wed 9/25/2013 11:01:32 PM
Subject: Julie Hewitt is you POC tomorrow on 316(b)/ESA

Her number is 566-1031. I will be out tomorrow and back Friday.

Robert Wood
Director,
Engineering and Analysis Division
202-566-1822ÿ

To: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Born, Tom[Born.Tom@epa.gov]; Levine, MaryEllen[levine.maryellen@epa.gov]; Witt, Richard[Witt.Richard@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]; Zobrist, Marcus[Zobrist.Marcus@epa.gov]; Saxena, Juhi[Saxena.Juhi@epa.gov]; Piziali, Jamie[Piziali.Jamie@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
Cc: Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Nagle, Deborah[Nagle.Deborah@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]
From: Penman, Crystal
Sent: Wed 9/25/2013 6:48:32 PM
Subject: Canceled: Endangered Species Act Constultation for 316(b) Cooling Water Intake Rule Call in Non-Responsive

To: Wood, Robert[Wood.Robert@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]
Cc: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Krieger, Andrew
Sent: Tue 9/24/2013 10:23:10 PM
Subject: 316(b) ESA consultation flowchart
316(b)_ESA_flowchart_v2.docx
316(b)_ESA_flowchart_v2.pdf

Betsy and Rob,

Sorry for the software snafu, but I'm up and running again. You'll notice that the scanned version of the flowchart that I previously sent isn't very high quality. Attached are high quality PDF (best for printing and viewing) and Word (editable) versions of the flow chart.

Let me know if how else I can help.

Thanks,

Andrew Krieger
ORISE Participant
Office of Science and Technology, Office of Water
US Environmental Protection Agency
krieger.andrew@epa.gov
Ph: 202-566-0851

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Roberts, Martha[Roberts.Martha@epa.gov]
From: Ganesan, Arvin
Sent: Tue 9/24/2013 3:40:16 PM
Subject: 316(b)

Hey ken,

On 316(b), understand that Bob asked for a bunch of things. Can we chat this afternoon to a) get this moving along and b) to see if we can help with 3rd floor process?

Whens good?

A

Arvin R. Ganesan

Deputy Chief of Staff for Policy

U.S Environmental Protection Agency

Office of the Administrator

202.564.5200

ganesan.arvin@epa.gov

To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Roberts, Martha[Roberts.Martha@epa.gov]
From: Anderson, Denise
Sent: Mon 9/23/2013 3:54:43 PM
Subject: 316(b) Discussion

Ct: Crystal Penman

Staff:
Ken Kopocis
Martha Roberts

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Penman, Crystal[Penman.Crystal@epa.gov]
From: Scozzafava, MichaelE
Sent: Mon 9/23/2013 3:13:55 PM
Subject: 316b note

Hi Ken,

Lisa (though her SA Martha) is moving the note to Bob P for review before it goes to the Administrator. Lisa suggests that we set up a quick call between you and Bob to walk him through how the note tracks with his thinking on the subject.

I'm copying Crystal to see if we can get that call set up later today or early tomorrow. Denise will probably reach out shortly.

Mike

Michael Scozzafava

Special Assistant

Office of the Administrator

ARN 3316

202-566-1376

To: Deputy Administrator[62Perciasepe.Bob73@epa.gov]; Anderson, Denise[anderson.denise@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; KeyesFleming, Gwen[KeyesFleming.Gwendolyn@epa.gov]; Dickerson, Aaron[Dickerson.Aaron@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Goo, Michael[Goo.Michael@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Garbow, Avi[Garbow.Avi@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]
Cc: Shriner, Paul[Shriner.Paul@epa.gov]; Balserak, Paul[Balserak.Paul@epa.gov]
From: Herckis, Arian
Sent: Thur 9/19/2013 4:14:45 PM
Subject: Canceled: Meeting re: 316B

SCt: Arian Herckis

Staff:
Deputy Perciasepe (OA)
Nancy Stoner, Ken Kopocis, Ellen Gilinsky, Elizabeth Southerland, Robert Wood, Julie Hewitt, Paul Shriner(OW)
Michael Goo (OP)
Avi Garbow, Steve Neugeboren (OGC)

Optional:
Gwen Keyes Fleming (OA)

To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]
Cc: Goo, Michael[Goo.Michael@epa.gov]; Roberts, Martha[Roberts.Martha@epa.gov]
From: Feldt, Lisa
Sent: Thur 9/19/2013 1:22:05 PM
Subject: ESA/316B

I talked with Bob this morning and shared our conversation last night. My sense is that with the overlay of the process that I sketched out with the words you have on the paper, that he will be comfortable. When you can get that together, send it on up and we can move forward to Administrator. Sound good?

Lisa Feldt

Associate Deputy Administrator

Office of the Administrator

Environmental Protection Agency

office: 202-564-4711

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Goo, Michael[Goo.Michael@epa.gov]
From: Balserak, Paul
Sent: Wed 9/18/2013 4:48:47 PM
Subject: RE: Pls send the 316b doc
316b Issues Update-final.docx

Ken,
Per Michael's request.
Paul

-----Original Message-----
From: Goo, Michael
Sent: Wednesday, September 18, 2013 12:29 PM
To: Balserak, Paul
Subject: Pls send the 316b doc

You prepared last night to Ken Kopocis. Thanks.
ÿ

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Bozek, Richard
Sent: Wed 9/18/2013 3:17:20 PM
Subject: FW: Follow-up to September 5 316(b) Meeting
316b McCarthy Letter 091713 final.pdf

Ken:

In case you haven't already seen this. If you have any questions, don't hesitate to call. Thank you.

From: Kuhn, Thomas
Sent: Tuesday, September 17, 2013 5:26 PM
To: McCarthy.gina@Epa.gov
Cc: perciasepe.bob@epa.gov
Subject: Follow-up to September 5 316(b) Meeting

Gina: Thank you for taking the time to meet with a group of our CEO's regarding the Clean Water Act § 316(b) cooling water intake structures rule. Attached is a letter outlining our perspective on several of the most critical remaining issues. If you have any questions, please contact me or have your staff contact Quin Shea (qshea@eei.org; 202-508-5027) or Rich Bozek (rbozek@eei.org; 202-508-5641).

701 Pennsylvania Avenue, N.W. | Washington, D.C. 20004-2696 | 202.508.5000 | www.eei.org

Edison Electric Institute

September 17, 2013

The Honorable Regina A. McCarthy
Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Federal Building
1200 Pennsylvania Ave., NW
Washington, DC 20460-0001

Dear Administrator McCarthy:

On behalf of the Board of Directors and member companies of the Edison Electric Institute (EEI), as well as our partners at the Nuclear Energy Institute (NEI), Clean Energy Group (CEG), and Utility Water Act Group (UWAG), we want to extend our sincere thanks to you and your team for the productive meeting on September 5 regarding industry issues with the Clean Water Act (CWA) § 316(b) cooling water intake structures rulemaking for existing facilities. As you know, this rulemaking, which will impact almost half of the existing U.S. generation capacity, is expected to be completed by November 4. We believe the rule can be designed to achieve important environmental benefits with cost-effective technology solutions, while avoiding inappropriate energy and reliability impacts and without imposing unnecessary costs on consumers.

Our September 5 meeting demonstrated that a constructive relationship among you, your staff, and the electric power sector can be mutually beneficial in charting a path toward environmentally protective and cost-effective regulation. Maintaining an open dialogue leads to more reasonable results, as already evidenced by the flexibility we understand EPA has incorporated into the draft final rule based on the comments addressing the Impingement Mortality Notice of Data Availability published in 2012.

During our meeting, you and your team asked for feedback on several issues of profound importance to the electric power industry. We are writing to address your questions and to offer our recommendations on how best to craft an acceptable final rule.

Use of Cost-Benefit Analysis as a Basis for Best Technology Available (BTA) Selection for Entrainment

EPA's proposed BTA standard for entrainment establishes a process for site-specific determination of entrainment requirements at individual facilities. This reflects EPA's determination that there is no single technology that qualifies as entrainment BTA for all facilities nationwide. EPA's proposal appropriately requires permitting authorities to consider nine factors, including costs and benefits, when making a BTA determination.

We understand that EPA's most recent thinking alters this requirement by making consideration of costs and benefits in BTA determinations optional. If cost/benefit balancing is optional, then

a permitting authority could require a cooling tower retrofit simply because it is technically feasible regardless of the huge costs and questionable benefits created by reducing impacts to life stages that typically have very high natural mortality rates. For many plants, the only realistic option would be either to install towers at a very high cost to the customers or shutter the facility.

We support site-specific entrainment BTA determinations. However, EPA should require permitting authorities to consider all nine factors, including costs and benefits, set out in the proposed rule in making entrainment decisions.

Stated Preference Survey (Willingness-to-Pay)

We understand that EPA will not rely on its national and regional stated preference survey results to justify the rulemaking, though EPA is continuing to evaluate the usefulness of the methodology to measure non-use benefits.

Use of Survey Results

For the same reasons that EPA is not using the survey results to justify the rulemaking, EPA should make clear that states cannot rely on the results in evaluating benefits in site-specific permitting decisions. There has not been any determination that the results are scientifically sound.

EPA can address this concern by stating explicitly that: (1) EPA's stated preference survey and its results have no relevance to any future application of the § 316(b) rule, including in permitting decisions and future guidance or other decisions by EPA or state permit writers; and (2) the results of EPA's national and regionally conducted survey should not be used to quantify the non-use benefits for a site-specific decision.

Use of Survey Methodology

We are also concerned about the inappropriate use of the willingness-to-pay (WTP) survey methodology in the § 316(b) context, especially since both the proposed rule and, as we understand it, the draft final rule implicitly require permittees to use this controversial methodology. For instance, as discussed in 40 C.F.R. § 125.98(e)(3), the proposed rule requires states to consider non-use benefits by requiring permitting directors to determine quantified and qualitative social benefits and social costs of available entrainment technologies, **including ecological benefits** and benefits to any threatened or endangered species. The proposed rule also requires at 40 C.F.R. § 122.21(r)(11) that the permittee conduct a *Benefits Valuation Study* that is to identify the "basis for any monetized values … assigned to changes in commercial and recreational species, forage fish, and shellfish, and to any other ecosystem or non-use benefits." It is our understanding that the draft final rule may go even further by precluding permitting directors from rejecting an entrainment technology based on the comparison of the costs and benefits if the information on benefits is inadequate, which EPA has suggested will be true if non-use benefits are not quantified. Further, it is our understanding that the draft final rule also incorporates the principle of WTP into the definition of social benefits.

Given EPA's decision to seek further review of its own WTP survey, EPA should not include any language in the final rule that might be interpreted to encourage or require states to pursue the use of such surveys, which are likely to inflate benefits and skew decision-making toward

closed-cycle cooling, in conflict with the Agency's own recognition that closed-cycle cooling is not BTA. Instead, the treatment of non-use benefits should be left to the states' discretion.

EPA can address our concerns by stating explicitly that quantification of non-use benefits is not required in site-specific decisions by state permitting authorities.

Definition of New and Existing Units at Existing Facilities

In what would be a significant change in definition, it is our understanding that EPA intends to treat units that replace the turbine and the condenser as "new units," and to require these units to install closed-cycle cooling except where the permittee has installed a high-efficiency unit. This would be true even where the modification or replacement results in no change in the capacity of an existing intake structure. However, EPA's authority under § 316(b) extends only to the *cooling water intake structure.* In the absence of a significant modification to the existing cooling water intake structure (beyond those undertaken expressly to comply with the impingement mortality and entrainment requirements of this final regulation), there is no statutory basis for regulating a modified or replacement unit any differently than an original or unmodified unit. Such a change in the definition of existing units is analogous to EPA creating a first of its kind new source review program for existing cooling water intake structures under the Clean Water Act without the legislative authority to do so. We believe that "repowered, rebuilt and replaced" units should be subject to the same impingement mortality and entrainment requirements as the rule applies to other units at existing facilities. Imposing a "cooling tower only" requirement on such units would be a disincentive to upgrade or repower facilities, which otherwise would lead to environmental benefits.

On a separate but related issue, uprates of existing nuclear facilities should not artificially be classified as "new units," thereby imposing a cooling tower requirement. Construction is presently underway at several of the nation's nuclear plants to install equipment and to increase the emissions-free electricity from these plants. These uprates have been approved by the Nuclear Regulatory Commission and involve billions of dollars of expenses that did not anticipate that the units would have to install closed-cycle cooling. The final rule language would jeopardize these current uprate projects and prevent future uprates.

The electric power sector strongly believes that EPA should define a new unit in the final rule the same way it did in its proposal—by expressly excluding "repowered, rebuilt or replaced" units from being defined as "new" units. The rule should also specify that nuclear plant uprates do not constitute a "new unit," and, therefore, do not trigger a requirement to install cooling towers. Facilities will need to replace turbines and/or condensers or component parts during the expected life of the facility. Requiring cooling towers upon replacement of these parts would prematurely close facilities and create disincentives to investments that otherwise would lead to environmental benefits.

Definition of Closed-Cycle Cooling and Waters of the United States (WOUS)

EPA has asked whether industry would find workable a rule that precludes impoundments classified as WOUS from qualifying as part of a closed-cycle cooling system as long as the Agency assures that it will not use this rule or revised WOUS guidance or rules to change the status quo as to the current exemption for waste treatment systems.

We do not think that approach would meet the concerns we discussed because EPA has not consistently recognized that waste treatment systems lawfully created in or by impounding waters of the United States are not themselves WOUS. Although EPA has acknowledged in regulations and guidance governing EPA's jurisdiction that waste treatment systems created in WOUS before passage of the CWA, and waste treatment systems lawfully created after passage of the CWA implementing regulations should not be disqualified from the waste treatment exemption, in practice the Regions have sometimes failed to abide by this policy. As a result, relying solely on the waste treatment system exemption could preclude the continued use of some impoundments specifically designed primarily for closed-cycle cooling. Such a result would be unfair, costly, and environmentally unnecessary.

In addition to maintaining the current regulatory exemption for waste treatment systems, EPA should specify that cooling ponds or impoundments lawfully created principally to serve as part of a closed-cycle cooling system can continue to serve that purpose and will satisfy § 316(b) for both impingement and entrainment.

Endangered Species Act and Section 7 Consultation

EPA and the U.S. Fish and Wildlife Service and National Marine Fisheries Service (Services) have now commenced formal consultation under Section 7 of the Endangered Species Act (ESA). In our September 5 meeting, EPA acknowledged that the consultation process should not blur the lines between the statutory authorities of the ESA and the CWA, and, further, that no new regulatory authority is envisioned for the Services.

It is our understanding, however, that EPA has added provisions in the draft final rule requiring permittees to submit permit application materials directly to the Services, and to coordinate directly with the Services for purposes of determining whether any more stringent impingement and entrainment control requirements are warranted at individual facilities. The provisions reportedly require States to impose any more stringent requirements deemed necessary by the Services.

However, EPA should remove from the rule any provisions inserting the Services directly into the § 316(b) compliance determination process. Neither the CWA nor the ESA provides the Services with any direct role in the National Pollutant Discharge Elimination System (NPDES) permitting process. Although the Services, like other federal and state agencies, are entitled to comment on draft permits, neither statute gives them any role in setting or implementing § 316(b) or determining NPDES permit provisions. The Services have ample authority to protect their interests in permit-based § 316(b) implementation by following customary procedures under the CWA and by using their enforcement authorities. Nothing further is authorized or required.

Low Capacity Utilization Units

EPA has recognized in other regulations that some low capacity utilization units (often peakers) are needed for grid reliability and local load balancing needs, and that such units are unable to economically bear the same compliance costs as baseload and other higher capacity units. Given how infrequently such facilities operate, there is little risk that any short-term impact from such units would have a material and adverse long-term impact on the environment. Therefore, EPA should specify a capacity factor or flow rate below which the final rule's requirements will not

apply, thus recognizing the limitations of these facilities to cost-effectively install impingement and entrainment controls.

EPA should adopt a provision similar to that found in the Mercury and Air Toxics Standards (MATS) rule, which provides a limited use subcategory for certain facilities with an annual capacity factor limit of no more than 8 percent measured over a 24-month block. Alternatively, a flow rate limit of approximately 15 percent of the maximum possible withdrawal volume on an annual basis could be used. It is vital that such a provision apply to units operated for grid reliability reasons, such as units dispatched to meet seasonal peak demand and situations where fuel flexibility is necessary to offset supply restrictions in a specific geographic region. Limiting such a provision to only units used for emergency purposes would not adequately address the fundamental need to allow peaking units to continue to operate.

Again, we thank you for your continued focus on this most important utility issue and for the prior work to address a number of our concerns. We look forward to working with you and your team to satisfactorily address the remaining issues and ensure that EPA promulgates a reasonable and environmentally protective final regulation.

Sincerely,

Michael W. Yackira
President & CEO, NV Energy
EEI Chair

Lewis Hay, III
Executive Chairman, NextEra Energy, Inc.
Immediate Past EEI Chair

Thomas F. Farrell
Chairman, President & CEO
Dominion

Christopher M. Crane
President & CEO, Exelon Corp.
316(b) Issue Leader

Gerry Anderson
Chairman, President & CEO
DTE Energy Company
EEI Policy Committee on Environment
Co-Chair

Ralph Izzo
Chairman, President & CEO
Public Service Enterprise Group, Inc.
EEI Policy Committee on Environment Co-Chair

cc: The Hon. Robert Perciasepe, EPA

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Goo, Michael[Goo.Michael@epa.gov]
Cc: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Smith, Kelley[Smith.Kelley@epa.gov]
From: Smith, Kelley
Sent: Wed 9/18/2013 1:39:02 PM
Subject: 316B-ESA

CT: Kelley Smith (Kelley will open the call)

Staff:

Nancy Stoner
Ken Kopocis
Ellen Gilinsky
Michael Goo

Purpose: Per Lisa Feldt-

Per a request of a few of you after the meeting yesterday, I talked with Bob P to try to get a bit more clarity on next steps. It would be hard to communicate this through e-mail so I would like to chat with a few of you. Unfortunately all of our calendars are probably tight but I could do 8 to 8:30 tomorrow of at 5. Just let me know

To: Goffman, Joseph[Goffman.Joseph@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Ann W Loomis (Services - 6)
Sent: Wed 9/18/2013 12:53:59 PM
Subject: 316(b) letter
316(b) Final McCarthy letter.docx

Joe and Ken,

Please see attached a letter that was sent to Administrator McCarthy last evening from those involved in the recent meeting on 316(b). It is intended to thank everyone for their keen attention to these issues. I expect that we will be asking for another meeting on the staff level.

Thanks,

Ann

Ann Loomis

Senior Advisor for Federal &

Environmental Policy

Dominion

202-585-4205

September 17, 2013

The Honorable Regina A. McCarthy
Administrator
U.S. Environmental Protection Agency
William Jefferson Clinton Federal Building
1200 Pennsylvania Ave., NW
Washington, DC 20460-0001

Dear Administrator McCarthy:

On behalf of the Board of Directors and member companies of the Edison Electric Institute (EEI), as well as our partners at the Nuclear Energy Institute (NEI), Clean Energy Group (CEG), and Utility Water Act Group (UWAG), we want to extend our sincere thanks to you and your team for the productive meeting on September 5 regarding industry issues with the Clean Water Act (CWA) § 316(b) cooling water intake structures rulemaking for existing facilities. As you know, this rulemaking, which will impact almost half of the existing U.S. generation capacity, is expected to be completed by November 4. We believe the rule can be designed to achieve important environmental benefits with cost-effective technology solutions, while avoiding inappropriate energy and reliability impacts and without imposing unnecessary costs on consumers.

Our September 5 meeting demonstrated that a constructive relationship among you, your staff, and the electric power sector can be mutually beneficial in charting a path toward environmentally protective and cost-effective regulation. Maintaining an open dialogue leads to more reasonable results, as already evidenced by the flexibility we understand EPA has incorporated into the draft final rule based on the comments addressing the Impingement Mortality Notice of Data Availability published in 2012.

During our meeting, you and your team asked for feedback on several issues of profound importance to the electric power industry. We are writing to address your questions and to offer our recommendations on how best to craft an acceptable final rule.

Use of Cost-Benefit Analysis as a Basis for Best Technology Available (BTA) Selection for Entrainment

EPA's proposed BTA standard for entrainment establishes a process for site-specific determination of entrainment requirements at individual facilities. This reflects EPA's determination that there is no single technology that qualifies as entrainment BTA for all facilities nationwide. EPA's proposal appropriately requires permitting authorities to consider nine factors, including costs and benefits, when making a BTA determination.

We understand that EPA's most recent thinking alters this requirement by making consideration

of costs and benefits in BTA determinations optional. If cost/benefit balancing is optional, then a permitting authority could require a cooling tower retrofit simply because it is technically feasible regardless of the huge costs and questionable benefits created by reducing impacts to life stages that typically have very high natural mortality rates. For many plants, the only realistic option would be either to install towers at a very high cost to the customers or shutter the facility.

We support site-specific entrainment BTA determinations. However, EPA should require permitting authorities to consider all nine factors, including costs and benefits, set out in the proposed rule in making entrainment decisions.

Stated Preference Survey (Willingness-to-Pay)

We understand that EPA will not rely on its national and regional stated preference survey results to justify the rulemaking, though EPA is continuing to evaluate the usefulness of the methodology to measure non-use benefits.

Use of Survey Results

For the same reasons that EPA is not using the survey results to justify the rulemaking, EPA should make clear that states cannot rely on the results in evaluating benefits in site-specific permitting decisions. There has not been any determination that the results are scientifically sound.

EPA can address this concern by stating explicitly that: (1) EPA's stated preference survey and its results have no relevance to any future application of the § 316(b) rule, including in permitting decisions and future guidance or other decisions by EPA or state permit writers; and (2) the results of EPA's national and regionally conducted survey should not be used to quantify the non-use benefits for a site-specific decision.

Use of Survey Methodology

We are also concerned about the inappropriate use of the willingness-to-pay (WTP) survey methodology in the § 316(b) context, especially since both the proposed rule and, as we understand it, the draft final rule implicitly require permittees to use this controversial methodology. For instance, as discussed in 40 C.F.R. § 125.98(e)(3), the proposed rule requires states to consider non-use benefits by requiring permitting directors to determine quantified and qualitative social benefits and social costs of available entrainment technologies, **including ecological benefits** and benefits to any threatened or endangered species. The proposed rule also requires at 40 C.F.R. § 122.21(r)(11) that the permittee conduct a *Benefits Valuation Study* that is to identify the "basis for any monetized values … assigned to changes in commercial and recreational species, forage fish, and shellfish, and to any other ecosystem or non-use benefits." It is our understanding that the draft final rule may go even further by precluding permitting directors from rejecting an entrainment technology based on the comparison of the costs and benefits if the information on benefits is inadequate, which EPA has suggested will be true if non-use benefits are not quantified. Further, it is our understanding that the draft final rule also incorporates the principle of WTP into the definition of social benefits.

Given EPA's decision to seek further review of its own WTP survey, EPA should not include any language in the final rule that might be interpreted to encourage or require states to pursue the use of such surveys, which are likely to inflate benefits and skew decision-making toward closed-

cycle cooling, in conflict with the Agency's own recognition that closed-cycle cooling is not BTA. Instead, the treatment of non-use benefits should be left to the states' discretion.

EPA can address our concerns by stating explicitly that quantification of non-use benefits is not required in site-specific decisions by state permitting authorities.

Definition of New and Existing Units at Existing Facilities

In what would be a significant change in definition, it is our understanding that EPA intends to treat units that replace the turbine and the condenser as "new units," and to require these units to install closed-cycle cooling except where the permittee has installed a high-efficiency unit. This would be true even where the modification or replacement results in no change in the capacity of an existing intake structure. However, EPA's authority under § 316(b) extends only to the *cooling water intake structure.* In the absence of a significant modification to the existing cooling water intake structure (beyond those undertaken expressly to comply with the impingement mortality and entrainment requirements of this final regulation), there is no statutory basis for regulating a modified or replacement unit any differently than an original or unmodified unit. Such a change in the definition of existing units is analogous to EPA creating a first of its kind new source review program for existing cooling water intake structures under the Clean Water Act without the legislative authority to do so. We believe that "repowered, rebuilt and replaced" units should be subject to the same impingement mortality and entrainment requirements as the rule applies to other units at existing facilities. Imposing a "cooling tower only" requirement on such units would be a disincentive to upgrade or repower facilities, which otherwise would lead to environmental benefits.

On a separate but related issue, uprates of existing nuclear facilities should not artificially be classified as "new units," thereby imposing a cooling tower requirement. Construction is presently underway at several of the nation's nuclear plants to install equipment and to increase the emissions-free electricity from these plants. These uprates have been approved by the Nuclear Regulatory Commission and involve billions of dollars of expenses that did not anticipate that the units would have to install closed-cycle cooling. The final rule language would jeopardize these current uprate projects and prevent future uprates.

The electric power sector strongly believes that EPA should define a new unit in the final rule the same way it did in its proposal—by expressly excluding "repowered, rebuilt or replaced" units from being defined as "new" units. The rule should also specify that nuclear plant uprates do not constitute a "new unit," and, therefore, do not trigger a requirement to install cooling towers. Facilities will need to replace turbines and/or condensers or component parts during the expected life of the facility. Requiring cooling towers upon replacement of these parts would prematurely close facilities and create disincentives to investments that otherwise would lead to environmental benefits.

Definition of Closed-Cycle Cooling and Waters of the United States (WOUS)

EPA has asked whether industry would find workable a rule that precludes impoundments classified as WOUS from qualifying as part of a closed-cycle cooling system as long as the Agency assures that it will not use this rule or revised WOUS guidance or rules to change the status quo as to the current exemption for waste treatment systems.

We do not think that approach would meet the concerns we discussed because EPA has not consistently recognized that waste treatment systems lawfully created in or by impounding waters of the United States are not themselves WOUS. Although EPA has acknowledged in regulations and guidance governing EPA's jurisdiction that waste treatment systems created in WOUS before passage of the CWA, and waste treatment systems lawfully created after passage of the CWA implementing regulations should not be disqualified from the waste treatment exemption, in practice the Regions have sometimes failed to abide by this policy. As a result, relying solely on the waste treatment system exemption could preclude the continued use of some impoundments specifically designed primarily for closed-cycle cooling. Such a result would be unfair, costly, and environmentally unnecessary.

In addition to maintaining the current regulatory exemption for waste treatment systems, EPA should specify that cooling ponds or impoundments lawfully created principally to serve as part of a closed-cycle cooling system can continue to serve that purpose and will satisfy § 316(b) for both impingement and entrainment.

Endangered Species Act and Section 7 Consultation

EPA and the U.S. Fish and Wildlife Service and National Marine Fisheries Service (Services) have now commenced formal consultation under Section 7 of the Endangered Species Act (ESA). In our September 5 meeting, EPA acknowledged that the consultation process should not blur the lines between the statutory authorities of the ESA and the CWA, and, further, that no new regulatory authority is envisioned for the Services.

It is our understanding, however, that EPA has added provisions in the draft final rule requiring permittees to submit permit application materials directly to the Services, and to coordinate directly with the Services for purposes of determining whether any more stringent impingement and entrainment control requirements are warranted at individual facilities. The provisions reportedly require States to impose any more stringent requirements deemed necessary by the Services.

However, EPA should remove from the rule any provisions inserting the Services directly into the § 316(b) compliance determination process. Neither the CWA nor the ESA provides the Services with any direct role in the National Pollutant Discharge Elimination System (NPDES) permitting process. Although the Services, like other federal and state agencies, are entitled to comment on draft permits, neither statute gives them any role in setting or implementing § 316(b) or determining NPDES permit provisions. The Services have ample authority to protect their interests in permit-based § 316(b) implementation by following customary procedures under the CWA and by using their enforcement authorities. Nothing further is authorized or required.

Low Capacity Utilization Units

EPA has recognized in other regulations that some low capacity utilization units (often peakers) are needed for grid reliability and local load balancing needs, and that such units are unable to economically bear the same compliance costs as baseload and other higher capacity units. Given how infrequently such facilities operate, there is little risk that any short-term impact from such units would have a material and adverse long-term impact on the environment. Therefore, EPA should specify a capacity factor or flow rate below which the final rule's requirements will not apply, thus recognizing the limitations of these facilities to cost-effectively install impingement

and entrainment controls.

EPA should adopt a provision similar to that found in the Mercury and Air Toxics Standards (MATS) rule, which provides a limited use subcategory for certain facilities with an annual capacity factor limit of no more than 8 percent measured over a 24-month block. Alternatively, a flow rate limit of approximately 15 percent of the maximum possible withdrawal volume on an annual basis could be used. It is vital that such a provision apply to units operated for grid reliability reasons, such as units dispatched to meet seasonal peak demand and situations where fuel flexibility is necessary to offset supply restrictions in a specific geographic region. Limiting such a provision to only units used for emergency purposes would not adequately address the fundamental need to allow peaking units to continue to operate.

Again, we thank you for your continued focus on this most important utility issue and for the prior work to address a number of our concerns. We look forward to working with you and your team to satisfactorily address the remaining issues and ensure that EPA promulgates a reasonable and environmentally protective final regulation.

Sincerely,

Michael W. Yackira
President & CEO, NV Energy
EEI Chair

Lewis Hay, III
Executive Chairman, NextEra Energy, Inc.
Immediate Past EEI Chair

Thomas F. Farrell, II
Chairman, President and CEO, Dominion
Former EEI Chair

Christopher M. Crane
President & CEO, Exelon Corp.
316(b) Issue Leader

Gerry Anderson
Chairman, President & CEO
DTE Energy Company
EEI Policy Committee on Environment Co-Chair

Ralph Izzo
Chairman, President & CEO
Public Service Enterprise Group, Inc.
EEI Policy Committee on Environment Co-Chair

cc: The Hon. Robert Perciasepe, EPA

To: Deputy Administrator[62Perciasepe.Bob73@epa.gov]; Anderson, Denise[anderson.denise@epa.gov]; Feldt, Lisa[Feldt.Lisa@epa.gov]; Ganesan, Arvin[Ganesan.Arvin@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; KeyesFleming, Gwen[KeyesFleming.Gwendolyn@epa.gov]; Dickerson, Aaron[Dickerson.Aaron@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]; Garbow, Avi[Garbow.Avi@epa.gov]; Goo, Michael[Goo.Michael@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]; Vaught, Laura[Vaught.Laura@epa.gov]; Kurlansky, Ellen[Kurlansky.Ellen@epa.gov]
From: Kukla, Alison
Sent: Fri 9/13/2013 3:18:10 PM
Subject: Follow-up to EEI meeting re: 316B and ESA

SCt: Arian Herckis

Staff:
Deputy Perciasepe, Lisa Feldt, Arvin Ganesan (OA)
Nancy Stoner, Ken Kopocis, Ellen Gilinsky, Elizabeth Southerland, Robert Wood, Julie Hewitt(OW)
Avi Garbow, Steve Neugeboren, Alexis Wade (OGC)
Michael Goo (OP)
Laura Vaught (OICR)
Ellen Kurlansky (OAR)

Optional:
Gwen Keyes Fleming (OA)

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Penman, Crystal
Sent: Fri 9/13/2013 12:50:04 PM
Subject: FW: 316(b) Meeting
cleanOptions paper for Administrator and Deputy briefing (9-12 v3).docx
cleanCommunication on ESA_v 5 pm 9-12-13.docx

-----Original Appointment-----
From: Penman, Crystal **On Behalf Of** Stoner, Nancy
Sent: Thursday, September 12, 2013 8:51 AM
To: Stoner, Nancy; Wood, Robert; Southerland, Elizabeth; Neugeboren, Steven; Hewitt, Julie; Zobrist, Marcus
Cc: Wade, Alexis; Witt, Richard; Levine, MaryEllen; Frace, Sheila; Born, Tom; Sawyers, Andrew; Saxena, Juhi; Piziali, Jamie; Gilinsky, Ellen
Subject: 316(b) Meeting
When: Friday, September 13, 2013 10:30 AM-11:15 AM (GMT-05:00) Eastern Time (US & Canada).
Where: 3233 EPA EAST

To: Ganesan, Arvin[Ganesan.Arvin@epa.gov]; Feldt, Lisa[Feldt.Lisa@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Penman, Crystal[Penman.Crystal@epa.gov]; Burley, Veronica[Burley.Veronica@epa.gov]; Herckis, Arian[Herckis.Arian@epa.gov]; Anderson, Denise[anderson.denise@epa.gov]
From: Smith, Kelley
Sent: Wed 9/11/2013 2:07:52 PM
Subject: Canceled: Follow-up to EEI meeting re :316(b) and ESA

Ct: Denise Anderson 202-564-1782

Staff:
Lisa Feldt, Arvin Ganesan (OA)
Ken Kopocis (OW)

Note: This meeting is being canceled so that a new time where the Administrator can join is found. The Scheduling office is currently looking at the 16th at 2:00 PM and the invite should be coming out shortly.- Kelley

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Wood, Robert[Wood.Robert@epa.gov]
From: Hewitt, Julie
Sent: Sun 9/8/2013 4:09:55 PM
Subject: Setting up a briefing for the Administrator on 316(b)

One take-away from the Bob P briefing on ESA on Friday was that we needed to submit a meeting request for a general briefing on 316(b) with the Administrator.

Just checking that EAD should send a meeting request forward, aiming for the Gina briefing to be this week, with the usual cast of OW, OGC, OP and OAR staff. That's what we'll prepare for 1st thing Monday if that sounds right to you. Would you like to see materials in advance or have a prebrief?

Thanks.

Cc: Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
From: Penman, Crystal
Sent: Thur 9/5/2013 3:29:36 PM
Subject: Follow-up with Services on ESA 316B Issues Call in 1 Ex. 6 - Personal Privacy
2013_09_05_11_15_59.pdf

POC Robert Wood 566-1822

9/5/13 for RW

APPENDIX B: Office of Water Meeting Request Form

Date Received in OW: _____

FOR: Nancy Stoner __√__ **Michael Shapiro** _____ **Ken Kopocis** _____ **Ellen Gilinsky** _____

Subject: Follow-up with Services on ESA 316B Issues

Meeting Requested By: Elizabeth Southerland

Date: Thursday, September 05, 2013

Office Director Approval: Elizabeth Southerland **Date:** 9/5/13

Date staff will be ready for this meeting: Friday, September 6, 2013

Latest date meeting can happen: Friday, September 6, 2013

Time needed for meeting: 20 Min _____ **45 Min** _____ **1 Hr** __√__ **Other** _____

Purpose of the meeting:

AA decision expected? Yes ___ No ___

Provide AA with information? Yes ___ No

What specifically is to be decided or presented? Why is a meeting needed?

Follow-up to senior manager check in meeting from the meeting on Wednesday, September 4, 2013 - to caucus on remaining 316(b) ESA issues.

Who will attend the meeting? (Give Full Names as listed in Notes and Identify Office)

Mandatory Attendees:

Michael Bean, Gary Frazer, Rick Sayers, Drew Crane, Ron Dean, Lois Schiffer, Patrice Ashfield, Jennifer Schultz, Robert Wood, Marcus Zobrist, Steve Neugeboren

Optional Attendees:

N/A

Person Providing Agenda for the Meeting (mandatory):

Name: Robert Wood **Phone:** 566-1822

Person Providing Briefing Material (if any) for the Meeting: Materials will be sent in advance.

Name: Robert Wood **Phone:** 566-1822

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Balserak, Paul
Sent: Wed 9/4/2013 9:43:42 PM
Subject: Accepted: Prebrief on 316(b) issues for meeting with Administrator and EEI

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]
From: Hewitt, Julie
Sent: Wed 9/4/2013 9:39:14 PM
Subject: For Administrator meeting on EEI
Background for Administrator meeting with EEI on Sept 5 2013.docx

Rob and I connected, and he review this. I hadn't thought to factor that in when I said "5 o'clock."

APPENDIX B: Office of Water Meeting Request Form

Date Received in OW: _____

FOR: Nancy Stoner __X_ Michael Shapiro _ Ken Kopocis _X_ Ellen Gilinsky _X

Subject: Endangered Species Act Consultation for 316(b) Cooling Water Intake Rule

Meeting Requested By: Tom Born Date: August 28, 2013

Office Director Approval: _____ **Date:** 8/28/13

Date staff will be ready for this meeting: September 3, 2013

Latest date meeting can happen: September 3, 2013

Time needed for meeting: 20 Min _____ 45 Min _____ 1 Hr ___X__ Other:

Purpose of the meeting:

AA decision expected? Yes ___ No ___

Provide AA with information? Yes ___ No

What specifically is to be decided or presented? Why is a meeting needed?
FWS/NOAA Senior Managers' Meeting: Elevation of 316(b) ESA Consultation Issues

Who will attend the meeting? (Give Full Names as listed in Notes and Identify Office)
Mandatory Attendees:

NOAA: Lois Schiffer (lois.schiffer@noaa.gov) General Counsel (202/482-4080), pamela.lawrence@noaa.gov, ron.dean@noaa.gov, Jennifer.Schultz@noaa.gov, mike.tust@noaa.gov, Kristine.Petersen@noaa.gov, Helen.Golde@noaa.gov, Donna.Wieting@noaa.gov

FWS: Gary Frazer (Gary_Frazer@fws.gov) Assit. Director Endangered Species (202/208-4646), Paul Souza (Paul_Souza@fws.gov) , patrice_ashfield@fws.gov, rick_sayers@fws.gov, drew_crane@fws.gov,

DOI: Michael_Bean@ios.doi.gov

EPA: Elizabeth Southerland, Robert Wood, Julie Hewitt, Alexis Wade, Tom Born, Steve Neugeboren, MaryEllen Levine, Deborah Nagle, Marcus Zobrist, Richard Witt, Jamie Piziali, Dawn Messier, Juhi Saxena, Andrew Sawyers, Brenda Mallory, Lynn Zipf, Jeff Lape, Jennifer Chan, Paul Balserak, Betsy Behl

Optional Attendees:

Person Providing Agenda for the Meeting (mandatory):
Name: Tom Born **Phone**: 202-566-1001

Person Providing Briefing Material (if any) for the Meeting: None
Name: _____ **Phone**: _____

Date

ROUTING AND TRANSMITTAL SLIP

08/28/13

TO: *(Name, office symbol, room number, building, Agency/Post)*	Initials	Date
1. Robert Wood	RWW	8/28/13
2. Elizabeth Southerland		8/28
3. Donetta Clark	DC	8/28/13
4.		
5.		
6.		
7.		
8.		
9.		
10.		

☐ Action	☐ File	☐ Note and Return
☐ Approval	☐ For Clearance	☐ Per Conversation
☐ As Requested	☐ For Correction	☐ Prepare Reply
☐ Circulate	☐ For Your Information	☐ See Me
☐ Comment	☐ Investigate	☒ Signature
☐ Coordination	☐ Justify	

REMARKS

Meeting request form for September 3, 2013, 316(b) ESA Senior Manager's Check-in Meeting with Nancy

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: *(Name, org. symbol, Agency/Post)*	Room No. – Bldg.
Tom Born	Phone No. (202) 566-1001

OPTIONAL FORM 41 (Rev. 1-94)
Prescribed by GSA

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Wade, Alexis
Sent: Wed 9/4/2013 2:40:47 PM
Subject: Tentative: Prebrief on 316(b) issues for meeting with Administrator and EEI

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Witt, Richard
Sent: Wed 9/4/2013 1:51:40 PM
Subject: Declined: Prebrief on 316(b) issues for meeting with Administrator and EEI

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]; McCabe, Janet[McCabe.Janet@epa.gov]; Feldt, Lisa[Feldt.Lisa@epa.gov]; Ganesan, Arvin[Ganesan.Arvin@epa.gov]; Deputy Administrator[62Perciasepe.Bob73@epa.gov]; Goffman, Joseph[Goffman.Joseph@epa.gov]
From: Kukla, Alison
Sent: Tue 9/3/2013 8:45:19 PM
Subject: Meetings with EEI

SCt: Alison Kukla
EEI Ct: Brian Wolff, Senior VP - bwolff@eei.org, 202-508-5300

Staff:
Nichole Distefano (OCIR)
Michael Goo (OP)
Ken Kopocis (OW)
Janet McCabe, Joe Goffman (OAR)
Deputy Administrator, Lisa Feldt, Arvin Ganesan (OA)

Attendees:
Michael Yackira
Thomas Farrell
Thomas Fanning
Nick Akins
Lew Hay
Gery Anderson
Ralph Izzo
Gregory Abel
Anthony Early
Pat Collawn
Tom King
Chrisopher Crane

Run of Show:
9AM: 316(b)
10AM: GHG NSPS Issues

To: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Born, Tom[Born.Tom@epa.gov]; Levine, MaryEllen[levine.maryellen@epa.gov]; Witt, Richard[Witt.Richard@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]; Zobrist, Marcus[Zobrist.Marcus@epa.gov]; Saxena, Juhi[Saxena.Juhi@epa.gov]; Piziali, Jamie[Piziali.Jamie@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]; Nagle, Deborah[Nagle.Deborah@epa.gov]
Cc: Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
From: Magruder, DeMara
Sent: Mon 8/26/2013 2:09:38 PM
Subject: Pre-brief Endangered Species Act Consultation for 316(b) Cooling Water Intake Rule (w/NOAA)- 9/28

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Keehner, Denise[Keehner.Denise@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Bissonette, Eric[Bissonette.Eric@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Scozzafava, MichaelE[Scozzafava.MichaelE@epa.gov]; Code, Tanya[Code.Tanya@epa.gov]; Ortiz, Agnes[Ortiz.Agnes@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Nelson, Tomeka[Nelson.Tomeka@epa.gov]
From: Nelson, Tomeka
Sent: Fri 8/23/2013 7:54:53 PM
Subject: 2-week review report
8.23.2013 OP Review Status Update and Planning.docx

To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
From: Penman, Crystal
Sent: Thur 8/22/2013 5:23:52 PM
Subject: Endangered Species Act Constultation for 316(b) Cooling Water Intake Rule Call in 1-866-
Non-Responsive

To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]
From: Penman, Crystal
Sent: Thur 8/22/2013 4:24:55 PM
Subject: Canceled: 316B

Per Nancy's request

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Keehner, Denise[Keehner.Denise@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Bissonette, Eric[Bissonette.Eric@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Scozzafava, MichaelE[Scozzafava.MichaelE@epa.gov]; Code, Tanya[Code.Tanya@epa.gov]; Ortiz, Agnes[Ortiz.Agnes@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Nelson, Tomeka[Nelson.Tomeka@epa.gov]
From: Nelson, Tomeka
Sent: Fri 8/16/2013 7:15:48 PM
Subject: 2-week review report
8.16.2013 OP Review Status Update and Planning.docx

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Keehner, Denise[Keehner.Denise@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Bissonette, Eric[Bissonette.Eric@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Scozzafava, MichaelE[Scozzafava.MichaelE@epa.gov]; Code, Tanya[Code.Tanya@epa.gov]; Ortiz, Agnes[Ortiz.Agnes@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]
From: Nelson, Tomeka
Sent: Fri 8/9/2013 8:57:18 PM
Subject: 2-week review report
8.09.2013 OP Review Status Update and Planning.docx

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Kurlansky, Ellen
Sent: Mon 8/5/2013 5:51:30 PM
Subject: Accepted: FW: 316(b) and low use facilities

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Hewitt, Julie
Sent: Mon 8/5/2013 4:12:51 PM
Subject: Accepted: 316(b) and low use facilities

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Microsoft Outlook
Sent: Mon 8/5/2013 4:09:05 PM
Subject: Meeting Forward Notification: 316(b) and low use facilities

Your meeting was forwarded

Goffman, Joseph has forwarded your meeting request to additional recipients.

Meeting
316(b) and low use facilities

Meeting Time
Wednesday, August 07, 2013 5:00 PM-5:30 PM.

Recipients
Kurlansky, Ellen

All times listed are in the following time zone: (UTC-05:00) Eastern Time (US & Canada)

Sent by Microsoft Exchange Server 2013

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Magruder, DeMara
Sent: Mon 8/5/2013 3:04:31 PM
Subject: RE: 316(b) Meeting -- Tuesday, August 6 at 5:00

Okay.

DeMara Magruder

202-564-2310

From: Kopocis, Ken
Sent: Monday, August 05, 2013 11:03 AM
To: Magruder, DeMara
Subject: FW: 316(b) Meeting -- Tuesday, August 6 at 5:00

This time doesn't work, please find an alternate.

Ken

From: Browne, Cynthia
Sent: Monday, August 05, 2013 10:10 AM
To: Kopocis, Ken
Subject: RE: 316(b) Meeting -- Tuesday, August 6 at 5:00

Ken, You may want to send out a rescheduler for Wednesday, 8/7 at 1:00 pm? Thanks, Cynthia

From: Joseph Goffman [mailto:joegoffman@gmail.com]
Sent: Sunday, August 04, 2013 4:57 PM
To: Browne, Cynthia; Kurlansky, Ellen; Goffman, Joseph
Subject: 316(b) Meeting -- Tuesday, August 6 at 5:00

Can you please reschedule this meeting given the conflicts on my/our schedule? My Wednesday seems pretty open especially since I do not plan to attend the 1:00 PM 2.5 meeting. Thanks.

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Browne, Cynthia
Sent: Mon 8/5/2013 2:09:49 PM
Subject: RE: 316(b) Meeting -- Tuesday, August 6 at 5:00

Ken, You may want to send out a rescheduler for Wednesday, 8/7 at 1:00 pm? Thanks, Cynthia

From: Joseph Goffman [mailto:joegoffman@gmail.com]
Sent: Sunday, August 04, 2013 4:57 PM
To: Browne, Cynthia; Kurlansky, Ellen; Goffman, Joseph
Subject: 316(b) Meeting -- Tuesday, August 6 at 5:00

Can you please reschedule this meeting given the conflicts on my/our schedule? My Wednesday seems pretty open especially since I do not plan to attend the 1:00 PM 2.5 meeting. Thanks.

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Keehner, Denise[Keehner.Denise@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Bissonette, Eric[Bissonette.Eric@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Scozzafava, MichaelE[Scozzafava.MichaelE@epa.gov]; Code, Tanya[Code.Tanya@epa.gov]; Ortiz, Agnes[Ortiz.Agnes@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]
From: Evalenko, Sandy
Sent: Thur 8/1/2013 10:10:35 PM
Subject: FW: 2-week review report
8.01.2013 OP Review Status Update and Planning.docx

To: Kaiser, Steven[kaiser.steven@epa.gov]; Klasen, Matthew[Klasen.Matthew@epa.gov]
Cc: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Peck, Gregory
Sent: Sat 7/27/2013 11:59:35 PM
Subject: Fw:
Jul 27 745 pm - Hearing Follow Up Questions - Kopocis - Clean.doc

Sven

Please find attached our responses to the Kopocis QFRs. This incorporates comments from OGC and the nominee.

Let me know if you have questions. Nice work Matt. Thanks. For your work - above and beyond!

Greg
Gregory E. Peck
Chief of Staff
Office of Water
USEPA
Washington, DC. 20460

202-564-5700

From: gep11@cox.net <gep11@cox.net>
Sent: Saturday, July 27, 2013 7:52:06 PM
To: Peck, Gregory
Subject:
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To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Ken Kopocis
Sent: Sat 7/27/2013 9:23:54 PM
Subject: QFRs with comments
Jul 27 240 pm - Hearing Follow Up Questions - Kopocis - Clean.doc

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Keehner, Denise[Keehner.Denise@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Bissonette, Eric[Bissonette.Eric@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Scozzafava, MichaelE[Scozzafava.MichaelE@epa.gov]; Code, Tanya[Code.Tanya@epa.gov]; Ortiz, Agnes[Ortiz.Agnes@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]
From: Nelson, Tomeka
Sent: Fri 7/26/2013 7:43:22 PM
Subject: 2-week review report
7.26.2013 OP Review Status Update and Planning.docx

To: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Stoner, Nancy
Sent: Fri 7/26/2013 6:27:20 PM
Subject: Re: 316(b)

Yay!

From: Southerland, Elizabeth
Sent: Friday, July 26, 2013 1:29:27 PM
To: Kopocis, Ken; Stoner, Nancy
Subject: Re: 316(b)

Great news! Thanks!

From: Kopocis, Ken
Sent: Friday, July 26, 2013 11:47:42 AM
To: Stoner, Nancy; Southerland, Elizabeth
Subject: 316(b)

Is being uploaded today.
KK
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ROCIS Agenda/Regs

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RIN: 2040-AE95 (201310)
Agency/Sub Agency: 2040 EPA/WATER
Tracking #:
Stage of Rulemaking: Final Rule Stage
Submitted By: Caryn Muellerleile
Submitted Date: 07/26/2013
Title: Criteria and Standards for Cooling Water Intake Structures

EO Review Package 2040-AE95

EO Review Package was successfully submitted at 07/26/2013 13:54:05 PM.

Primary Document: EO12866_Cooling Water Intakes_2040-AE95_Preamble_20130722.docx

Supplementary Documents

Title	Document	Date Uploaded
EO12866_Cooling Water Intakes_2040-AE95_Final_Rule_20130722.docx	EO12866_Cooling Water Intakes_2040-AE95_Final_Rule_20130722.docx	07/26/2013
EO12866_Cooling Water Intakes_2040_AE95_BenAnal_20130719 (2).pdf	EO12866_Cooling Water Intakes_2040_AE95_BenAnal_20130719 (2).pdf	07/26/2013
EO12866_Cooling Water Intakes_AE95-2040_EconAnal_20130605.pdf	EO12866_Cooling Water Intakes_AE95-2040_EconAnal_20130605.pdf	07/26/2013

To: Kopocis, Ken[Kopocis.Ken@epa.gov]
From: Gilinsky, Ellen
Sent: Fri 7/26/2013 4:18:45 PM
Subject: Re: 316(b)

Yay.

From: Kopocis, Ken
Sent: Friday, July 26, 2013 11:50:23 AM
To: Gilinsky, Ellen
Subject: Fw: 316(b)

FYI

From: Kopocis, Ken
Sent: Friday, July 26, 2013 11:47:42 AM
To: Stoner, Nancy; Southerland, Elizabeth
Subject: 316(b)

Is being uploaded today.
KK
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To: Goffman, Joseph[Goffman.Joseph@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Barron, Alex[Barron.Alex@epa.gov]
From: Goo, Michael
Sent: Fri 7/26/2013 3:22:09 PM
Subject: 316b

Bob agreed this am that we should just go ahead and upload but then said he wanted to check in person with Joe one last time. He said he had a meeting with Joe, my guess is he means the methane meeting. Joe and Alex can you be sure to buttonhole him before or after that meeting? Then we will move to upload. Thx. ÿ

To: Kaiser, Sven-Erik[Kaiser.Sven-Erik@epa.gov]; Davis, CatherineM[Davis.CatherineM@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; McDermott, Marna[McDermott.Marna@epa.gov]
From: Klasen, Matthew
Sent: Fri 7/26/2013 1:45:00 PM
Subject: Here's Ken's QFRs in Word
7.23.13 Hearing Follow Up Questions - Kopocis - Questions Only.docx

…and here, for reference, are Ken's questions in Word.

I realize the format is (currently) a bit different than the two previous ones that Kathy circulated, and I'll work today to harmonize both of them as we move along.

Thanks,
Matt

Matt Klasen

U.S. Environmental Protection Agency

Office of Water (IO)

(202) 566-0780

cell (202) 380-7229

Environment and Public Works Committee Hearing
July 23, 2013
Follow-Up Questions for Written Submission

<u>Questions for Kopocis</u>
Questions from: Senator Barbara Boxer

1. The Office of Water is responsible for administering two of the nation's most important infrastructure investment programs- the Clean Water and Safe Drinking Water State Revolving Funds (SRFs). Unfortunately, infrastructure in this country continues to decline. The American Society of Civil Engineers rates our wastewater and drinking water infrastructure a "D".

Do you commit to work with this Committee to ensure that we are adequately investing in the Nation's wastewater and drinking water infrastructure?

b. Even in the tight budget times that we face, will you work to ensure EPA continues to place a priority on investment in the State Revolving Funds?

2. EPA recently released an integrated planning framework to help cities comply with stormwater and wastewater requirements. The framework ensures cities will reduce harmful pollution and comply with the Clean Water Act but docs so in a flexible manner that allows local governments to address the worst problems first and prioritize investments.

a. Do you believe this is a successful model that EPA can use to work with municipalities to reduce pollution?
b. If confirmed, will you work with state and local governments to promote the use of this framework around the country?

3. It is critical that EPA use the best available science when implementing federal laws, such as the Safe Drinking Water Act, and carrying out policies to protect water quality in lakes and rivers.

a. Could you please describe the importance that you place on ensuring the use of the best available science in making decisions under the Clean Water Act and Safe Drinking Water Act?
b. If you are confirmed, will you ensure that the Agency continues the use of the best available science in making decisions about safe drinking water and clean rivers and lakes?

4. Mr. Kopocis, the majority of your career has been spent here in Congress, including working as a member of the staff of this Committee. You worked on numerous bipartisan initiatives, including the successful passage of the Water Resources Development Act of

2007.

a. If confirmed, what experiences and lessons from your congressional career will you bring to the Office of Water?
b. What is your perspective on how the Office of Water can work best with this Committee and the Congress?

5. Will you follow the Safe Drinking Water Act in establishing a drinking water standard for perchlorate?

Senator David Vitter

Topic: "Waters of the United States" Guidance Document

1. During this past week's nomination hearing, I thought your answer to my question regarding the statutory authority for the Clean Water Act (CWA) draft Guidance was unclear.
a. Explain the Environmental Protection Agency's (EPA) statutory authority to conduct "Guidance" on what constitutes "waters of the United States"?

2. It is also my understanding that under the draft Guidance, the Army Corps of Engineers and EPA would assert jurisdiction over tributaries, meaning "a natural, man-altered, or man-made water body" with an ordinary high water mark and including ditches that "drain natural water bodies (including wetlands) into the tributary system of a traditional navigable or interstate water."

a. Does this regulatory assertion apply to virtually any ditch through which water flows?

b. If not, how does the Guidance's purported tributaries jurisdiction comport with the plurality's opinion in Rapanos (which emphasized that jurisdictional waterbodies must be described "in ordinary parlance as 'streams[,] ... oceans, rivers, [and] lakes'" (Rapanos, 547 U.S. at 739)), and with Justice Kennedy's concurrence in Rapanos (which recognized that "the breadth of [a] standard ... regulat[ing] drains, ditches, and streams remote from any navigable-in-fact water and carrying only minor water volumes toward it ... precludes its adoption" *(Rapanos,* 547 U.S. at 781 (Kennedy, J., concurring))?

3. The draft Guidance asserts that the precursor statutes to the CWA "always subjected interstate waters and their tributaries to federal jurisdiction."
a. Given that for a century prior to the CWA courts "interpreted the phrase 'navigable waters of the United States' in the [CWA's[]] predecessor statutes to refer to interstate waters that are 'navigable in fact' or readily susceptible to being rendered so," *(See* Rapanos v. United States, 547 U.S. 715, 723 (2006) (plurality opinion)) is this assertion in the Guidance accurate?

b. Isn't it instead true that all interstate waters have never been subject to federal control, and that the exercise of federal jurisdiction over all interstate waters has no legal basis?

4. During your confirmation hearing you were asked about the following statement in an EPA fact sheet titled "Agriculture Exemptions Remain:" "This guidance does not address the regulatory exclusions from coverage under the CWA for waste treatment systems and prior converted cropland, or practices for identifying waste treatment systems and prior converted cropland." Referring to this statement in the fact sheet, Senator Fischer asked you about the status of the exemption for prior converted

cropland. You testified that there is no attempt in the draft guidance or in any documents currently under consideration to in any way adversely affect the current exemption for prior converted cropland.
a. Is the same true for exemptions for waste treatment systems?

b. Is EPA attempting in the draft guidance or in any documents currently under consideration within the Agency (including a proposed rule, draft guidance, permit, or enforcement action) to in any way adversely affect the current exemption for waste treatment systems?

Topic: EPA's Draft Science Synthesis Report on the Connectivity of Streams and Wetlands to Downstream Water

5. Mr. Kopocis, your office, the Office of Water, has requested the Office of Research and Development (ORD) to develop a report on the connectivity of streams and wetlands to downstream waters. I am told ORD confirmed that the draft report is COMPLETED and awaiting transmittal to the Science Advisory Board (SAB) panel for its review.
a. Under the Administrator's pledge, made during her confirmation hearings, to increase transparency, will you commit to releasing the report immediately so that the public can begin its review?

b. What public interest is served by embargoing the report?
c. I understand it is a large and complex report but what harm would there be in that approach?
d. Who decides whether the now completed draft should be made available to the public?

Topic: EPA's Conductivity "Benchmark"

6. While the U.S. District Court for the District of Columbia set aside EPA's conductivity "benchmark" that it had applied to Appalachian streams in the case of *NMA* v. *Jackson,* EPA recently published several papers supporting its conductivity actions, and has stated that it is in the process of developing a conductivity water quality criteria. In the past, EPA has failed to address scientific critiques that have produced evidence that conductivity is not a good indicator of benthic/aquatic health.

a. Going forward, what plans does EPA have to take this growing number of studies into account?

b. How does EPA intend to convert a field-based study performed in Appalachian waters into a national standard?

Topic: EPA's Authority Under Section 404(c) of the CWA

7. In March, 2012, the U.S. District Court for the District of Columbia struck down EPA's retroactive revocation of a mining-related CWA Section 404 permit, holding unequivocally that EPA has no authority to retroactively veto CWA Sec. 404 permits issued by the U.S. Army Corps of Engineers. However, EPA appealed that decision and in April of 2013, the U.S. Court of Appeals for the District of Columbia reversed the decision of the District Court.

a. What do you think the practical effect on industry will be of having Section 404 permits subject to EPA's veto authority even years after permit issuance and even if the permittee is in full compliance with the terms of the permit?

8. During deliberations on the CWA in Congress, Senator Muskie noted that there are three essential elements to the CWA. These are "uniformity, finality, and enforceability." EPA Administrator Gina McCarthy likewise acknowledged the importance of providing permittees with a sense of finality upon permit issuance.
a. How will you, in your capacity of Assistant Administrator of Water, work to implement the CWA in a manner that provides uniformity and finality throughout EPA's regulatory programs and permitting decisions.

b. How do the assertions made by EPA regarding the scope of its authority under Section 404 comport with the notion of permit finality?

c. Have you considered what effects EPA's actions might have on state Surface Mining Control and Reclamation Act (SMCRA) permitting programs?

Topic: EPA's Draft Bristol Bay Watershed Assessment and Pebble Mine

9. The EPA's Bristol Bay Watershed Assessment looks to be a potential precursor to an unprecedented veto of a mining project even before the project proponent has had a chance to submit a permit application. Along with other Committee members, I recently asked the agency to explain what harm would result from the Agency allowing the normal regulatory process to play out, instead of its current approach of speculating on hypothetical mining scenarios. EPA's July 16, 2013, response contended that abandoning the prejudicial assessment and allowing the CWA and National Environmental Policy Act (NEPA) procedures to play out would "increase uncertainty among Bristol Bay stakeholders," even though it is EPA's prejudicial evaluation of the Pebble Mine project that caused the uncertainty in the region.

a. Why does EPA feel it cannot evaluate a project solely on its merits and only once an actual permit application is submitted?

b. List and explain all economic impact analyses the Agency has done in the region.

c. Specifically, can you speak to the unemployment rate and poverty-associated challenges that may or may not be alleviated for people in that part of Alaska with the mine as a potential income source- or is this a factor that EPA's analysis does not address?

10. EPA's July 16, 2013, letter also called for the Pebble Mine proponents to submit their final mine plan.
a. Does EPA believe that project proponents do not have a right to decide for themselves when it is appropriate to begin the permitting process and when to submit their own permit application?

11. You indicated in your oral testimony that EPA "chose to not favorably respond" to a petition to preemptively veto the potential Pebble Mine project in Alaska. Your answer appears to leave open the possibility that EPA may still favorably respond to the petition at some point and preemptively veto the project before the project proponent submits its permitting applications.

a. Has EPA decided once and for all that it will not preemptively veto the Pebble Mine project?

12. Also during your oral testimony, and in response to my question regarding how much money EPA has spent to date on the Bristol Bay Watershed Assessment, you indicated that EPA estimates it has spent through earlier this year approximately $2.4 million in external costs, but you did not know of an estimate of the internal costs to EPA.
a. Is it true that EPA lacks an estimate or accounting for the internal costs spent on the watershed assessment?
b. If not, please provide the estimate.

<u>Topic: Proposed Rule for Cooling Water Intake Structures under Section 316(b) of the CWA and EPA's "Stated Preference Survey"</u>

13. Unlike programs for other media, water impacts are specific to the conditions present in individual waterbodies.
a. Given this premise, will the final Section 316(b) rule provide the necessary flexibility for state regulators to implement it based on local conditions?

b. Also, will the Office of Water under your leadership shift direction and focus on the use of science instead of relying on flawed opinion surveys to develop unsupportable

benefits positions when conducting economic analysis?

14. How many human health impacts will be avoided if the proposed Section 316(b) standards are promulgated?

15. Can you please explain how utilizing the stated preference survey complies with the Data Quality Act and comports with the best available science?

16. How does EPA intend to utilize its final stated preference survey report?

17. Will you please provide the charge questions EPA is submitting to the SAB with regard to the stated preference survey for the Section 316(b) rule?

18. Does EPA intend to create a new subcommittee or use the existing subcommittees?

19. What is the purpose of seeking consultation from the Fish and Wildlife Service on 316(b)?

20. How does EPA intend to use the Biological Evaluation?

<u>Topic: Definition of"Fill Material"</u>

21. The current definition of fill material, finalized in May, 2002, unified the Corps and EPA's prior conflicting definitions so as to be consistent with each other and the structure of the CWA. The current rule solidifies decades of regulatory practice, and includes as fill material those materials that, when placed in waters of the U.S., have the effect of raising the bottom elevation or filling the water. However, while both EPA and the Corps have stated that they are now considering revising the definition of fill material, Acting Assistant Administrator for Water Nancy Stoner stated at a May 22, 2013, Subcommittee on Water Resources and Environment hearing that EPA is not actively involved in discussions with the Corps on revising the rule.

a. Will you commit to maintaining the current regulatory definition of fill material?

b. What is EPA's rationale for potentially revisiting the well-established division of the Section 402 and Section 404 programs?

c. What specific problems is EPA seeking to address by revisiting the definition of fill material, and how exactly is EPA intending to address them?

d. Has EPA yet considered the time and costs associated with making such a change to the two major CWA permitting schemes – Sections 402 and 404?

Topic: National Stormwater Discharge Rule

22. I am happy to hear that EPA has decided to comply with CWA Section 402(p)(6) and will complete a study and submit to Congress a report on the necessity of new stormwater discharge rules under Section 402(p)(S) prior to issuing any new stormwater regulations. Please understand that this requirement is not a paper exercise. Notwithstanding this commitment, I am concerned that EPA fails to understand the purpose of this study and report and EPA's responsibilities and authorities under the CWA.

a. Do you agree that the potential regulation of additional sources of stormwater (other than sources identified in Section 402{p)(2)) is a complex issue of great interest to states, municipalities, small businesses, and other stakeholders?

b. Do you agree that the development of the study and report to Congress under section 402(p)(5) should be an open and transparent process with stakeholder input, including the opportunity to comment on both a draft study and a draft report?

c. Do you agree that the study must be completed before a report is issued?

d. Do you agree that the development of regulations under Section 402(p)(6) must be based on the results of studies under section 402(p)(5)?

e. Will you commit to me that you will comply with the CWA and suspend any stormwater rulemaking efforts until a study and report under Section 402(p)(5) are completed? Any rule that is developed without the benefit of the results of the study is ultra vires of EPA's authority under section 402(p)(6).

23. Do you agree that the CWA does not regulate the flow of water?

24. Do you agree that EPA can require permits under Section 402 only for discharges of pollutants from a point source to a water of the United States?

25. Explain the purpose of EPA's new "National Stormwater Calculator," given the fact that this tool estimates the runoff of water, not the discharge of pollutants from a point source.

26. Can you assure the Committee that this Calculator will not be used for any regulatory purpose, given the fact that the CWA does not regulate water?

27. Can you assure this Committee that this Calculator will not be used to usurp the authority retained by States under Section 101(g) and will not in any way be used to

affect the quantities of water within waters of a State?

28. Can you assure me that EPA will not attempt to regulate water as a surrogate for a pollutant, in violation of the Eastern District of Virginia's recent decision in *VA Dept. of Transportation v. EPA* (holding that EPA may not regulate stormwater as a surrogate for a pollutant)?

29. Unless EPA has decided to forego rulemaking under Section 402(p)(6), please explain to me why EPA has expended federal resources on the development of a Calculator, which has no regulatory purpose, while continuing to fail to comply with Section 402(p)(5).

Topic: *Sackett v. EPA:*

30. In *Sackett v. EPA,* the Supreme Court held that the Sackett family in Priest Lake, Idaho could obtain immediate judicial review of a CWA compliance order. I recognize that the Sacketts continue to fight the merits of EPA's compliance order in federal district court, but I would like to better understand the circumstances behind EPA's decision to deny the Sacketts their day in court in the first place.

a. Was it fair for the agency to give the Sacketts the so-called "option" of going through the CWA permitting process or awaiting civil prosecution just so that they could contest EPA's position that their land contained jurisdictional wetlands?

b. Did the EPA apologize to the Sacketts for denying them their day in court for more than four years?

c. If the agency has not or you do not know, can you make sure that EPA does indeed do so? An apology would at least demonstrate that the Agency has some understanding of the toll this case has taken on the Sacketts.

31. If a landowner receives or obtains a jurisdictional determination from the EPA which indicates that his or her land is jurisdictional wetlands, may the landowner challenge the determination immediately in court if he or she believes the land is not jurisdictional wetlands?

32. If you are confirmed, will the Office of Water and EPA continue to prioritize the prosecution of small landowners who unwittingly cause little to no impacts to wetlands and other waterbodies, or will the Office of Water and EPA instead focus on actual and significant environmental threats?

Topic: Hydraulic Fracturing

33. In 2010, EPA made an announcement on its webpage, without providing a notice and comment period, that requires underground injection control permits for diesel fuel related hydraulic fracturing. Subsequently, EPA proposed a draft guidance document detailing the regulatory program for hydraulic fracturing operations using diesel fuels. At no point has EPA acknowledged the congressional mandate in the Safe Drinking Water Act (SDWA) which states that EPA may not prescribe requirements which interfere with or impede the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production or natural gas storage operations... unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection.

Does EPA intend to abide by the limitations imposed on EPA under the SDWA?

b. If yes, what evidence has EPA supplied that new regulations are essential to assure that underground sources of drinking water will not be endangered by such injection?

c. Has EPA undertaken any analysis related to current industry practices and has EPA considered the robust oil and natural gas regulatory programs in place at the state level?

d. What has been your role and the role of the Office of Water with the ongoing EPA study on hydraulic fracturing?

e. When will the study be complete?

f. What is the status of prospective sites being tested for the study?

<u>Topic: National Selenium Water Quality Criterion</u>

34. EPA is currently involved in a scientific assessment of selenium that will be used to propose a new national selenium water quality criterion. EPA has stated that it intends to put out its proposed criteria for public comment this coming fall. In response to her own confirmation questions, EPA Administrator Gina McCarthy committed to ensuring that EPA reviews technical comments it receives on any proposed selenium criteria document and makes appropriate revisions to ensure that any final criterion is of high quality.

a. Under your leadership, what would the Office of Water's strategy be for incorporating relevant scientific critiques and comments received into its final selenium criteria?

35. Administrator McCarthy further stated that EPA would work with industry to develop a national selenium criterion that satisfies technical standards while retaining appropriate site-specific flexibility.

a. How will EPA take the site-specific nature of selenium issues into account when developing its national criterion?

Topic: Effluent Limitation Guideline for Coalbed Methane Operations

36. EPA continues to move forward with an effluent limitation guideline (ELG) for coalbed methane operations. Since the time that EPA began this initiative, the dynamics related to coalbed methane production have changed. EPA's ELG plan assumes natural gas prices in the range of approximately $7 mcfto over $9 mcf. Today the price of natural gas remains near $4 mcf. The low price of natural gas makes coal bed methane less economically competitive, resulting in a decrease in coalbed methane production. Additionally, most of the produced water production associated with coal bed methane operations occurs at the beginning of the production process because the coalseam must be dewatered to allow gas to flow to the surface. Therefore, with few new coalbed methane operations being contemplated, most of the coalbed methane produced water has already occurred.

a. In light of these dynamics, why is EPA's effort to promulgate a coalbed methane effluent limitation guideline a valuable exercise?

Topic: Standards for Perchlorate under the Safe Drinking Water Act (SDWA)

37. As you are no doubt aware, the EPA Office of Water is in the midst of a rulemaking to set standards for perchlorate under the SDWA. Members of this Committee have had questions as to whether the risks presented by perchlorate justify the extensive resources that EPA has invested to date in this controversial rulemaking. Most recently, the SAB questioned EPA's entire approach for setting this standard and recommended that the Agency use a different methodology.

a. If you are confirmed, will you assure us that you will undertake a thorough and independent assessment of this rulemaking and determine whether regulating perchlorate under the SDWA is a rational and reasonable use of the Agency's limited resources?

b. If you determine that regulating perchlorate under the SDWA is a rational and reasonable use of the Agency's limited resources will you provide an explanation of other EPA priorities that will need to be delayed or abandoned in order to finalize the perchlorate MCL?

Topic: *Iowa League of Cities v. EPA*

38. In *Iowa League of Cities v. EPA,* the Eighth Circuit determined that two letters

from EPA to Senator Grassley regarding wastewater treatment processes were the equivalent of regulations. Both were vacated as procedurally invalid. However, it has come to my attention that EPA believes that *Iowa League of Cities* was wrongly decided and may attempt to limit this decision to the Eighth Circuit. EPA must recognize the need for transparency and predictability in the regulatory system and go through the proper administrative channels to clarify or develop new rules with respect to wastewater treatment and other activities.

a. Accordingly, will you commit to applying the *Iowa League of Cities* decision nationally?

Topic: *NMA v. Jackson*

39. The U.S. District Court for the District of Columbia in the case of *NMA v. Jackson* (now *NMA v. Perciasepe* on appeal) recently struck down several EPA actions-specifically, EPA's Enhanced Coordination Process (ECP) and Multi-Criteria Integrated Resource Assessment (MCIR) for Appalachia surface coal mining, as well as EPA's guidance document, "Improving EPA Review of Appalachian Surface Coal Mining Operations Under the CWA, National Environmental Policy Act, and the Environmental Justice Executive Order"-as violating the CWA and Administrative Procedure Act (APA), as well as, in the case of the guidance document, the Surface Mining Control and Reclamation Act. Administrator McCarthy stated that EPA has directed its field offices not to use the guidance documents impacted by the court decision and instead to rely on regulations promulgated under the APA.

a.What future actions does EPA intend to take to ensure that the court's decision is fully implemented?

Senator James Inhofe

1. According to the Office of Information and Regulatory Affairs' (OIRA) website controversial EPA draft guidance called "Clean Water Protection Guidance" has been undergoing White House review since February 2012. One of the more controversial concepts contained in the EPA draft is how EPA could assert federal jurisdiction over any isolated wetland "if the Agency found a "significant nexus" between the isolated wetland and a traditional navigable water (TNW) or interstate waters (IW) based upon a so called biological or ecological connection. This biological or ecological connection between an isolated wetland and a TNW or IW can form the basis of EPA's "significant nexus" test as to why an otherwise isolated wetlands or even categories of land features known as "other waters" (i.e., intermittent stream, wet meadow, playa lake, prairie potholes, etc.), could be found by EPA/Corps to be jurisdictional under the CWA.

In 2011, the U.S. Fish & Wildlife Service (Service) entered into a voluntary legal settlement with just two environmental groups. Under terms of that legal settlement, the Service is scheduled to make hundreds of species listing determinations and designation of critical habitat under Endangered Species Act (ESA) over the next three years including hundreds of aquatic species (fish, mussels, and amphibians). Private landowners, whose property has been designated as critical habitat for an endangered or threatened species under ESA, face the risk of having their property subject to the ESA's regulatory and permitting requirements. However, under EPA's draft "Clean Water Protection Guidance" these same landowners also face having otherwise non-jurisdictional isolated wetlands becoming jurisdictional wetlands because of this presumed biological or ecological connection.

a. Under the pending draft Clean Water Act guidance how might the designation of critical habitat by the Service under the ESA; impact how EPA applies the "significant nexus" when evaluating whether an otherwise isolated wetland would become a jurisdictional wetland under the Clean Water Act (CWA)?

2. EPA is developing a national stormwater rulemaking for new and redeveloped sites that will require retention of stormwater, and expand the stormwater programs for MS4's and States. MS4's have programs to manage stormwater from new and redeveloped sites, yet EPA's new regulation will continue to target States and thousands of local governments that do not have the resources to appropriately implement and enforce the existing construction stormwater program, much less a substantially expanded program contemplated by the national stormwater rulemaking.

a. In developing this new regulation, how does EPA plan to minimize the burden on property owners, developers, state and local government that are already struggling to meet the existing regulatory requirements?

3. EPA is seeking to justify its costly proposed 316(b) rule, which would affect more than 1,260 power plants and industrial facilities nationwide, on the basis of a mail-in

public opinion survey asking "how much" a random group of individuals would be willing to pay to reduce harm to fish at cooling water intakes. This willingness-to-pay approach to determining "benefits" contrasts sharply with the far more traditional approach used by EPA in its earlier 316(b) rulemakings and other rulemakings. The earlier analyses relied on actual market prices and costs incurred by individuals, rather than hypothetical questions in a public survey. The "willingness-to-pay" or "stated preference" survey is clearly intended to increase the anticipated benefits of the proposed rule and justify costly controls, such as cooling towers. Using such unreliable benefit estimates will inappropriately lead to extremely expensive cooling water controls that would cause additional plants to shutter. Recall that in October 20 I 0 N ERC issued a report concluding that 316(b) could have economic impacts nearly three times greater than the combination of the Cross State Air Pollution Rule and the Mercury and Air Taxis Standards. See NERC, 2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations (October 2010).

a. Given all these problems, would you support withdrawing the survey and clarifying that the survey and its results are inappropriate to use in justifying the final rule or requirements at individual facilities?

4. In EPA's proposed 316(b) rule EPA has adopted starkly different approaches to managing "impingement" and "entrainment" at existing cooling water intake structures. For entrainment, EPA appropriately adopted a site-specific approach, recognizing that (a) existing facilities already have measures in place to protect fish, (b) further measures may or may not be needed, and (c) the costs, benefits, and feasibility of such measures have to be evaluated at each site. Yet for impingement, EPA adopted rigid, nationwide numeric criteria that appear unworkable and in many cases unnecessary. In a notice of data availability issued last year, EPA signaled that it would consider a more flexible approach for impingement.

a. In the final rule that is due this fall, would you support replacing the original impingement proposal with a more flexible approach that pre-approves multiple technology options and allows facility owners to propose alternatives to those options if the costs of additional measures would outweigh benefits?

Senator John Barrasso

1. Is there anything you disagree with regarding the proposed Clean Water Act jurisdictional guidance?

2. If confirmed, will you continue EPA's practice of using guidance to make major policy decisions regarding the Clean Water Act, or other federal laws under your jurisdiction, as opposed to going to Congress to seek changes?

3. What is your understanding of the role Congress plays versus the EPA in terms of who makes the laws?

4. Do you think Congress originally wanted EPA to regulate ephemeral streams that only have water in them during rain fall events?

5. Do you believe Congress provided limits to federal authority in the Clean Water Act? Please explain in detail what those limits are.

6. The EPA and the Corps affirm that the Clean Water Act Jurisdictional Guidance will result in an increase in jurisdictional determinations which will result in an increased need for permits. How many more EPA personnel and taxpayer funds will be needed to implement this guidance if it goes forward?

7. Do you believe that additional regulatory costs associated with changes in jurisdiction and increases in permits will erect bureaucratic barriers to economic growth, negatively impacting farms, small businesses, commercial development, road construction and energy production?

8. Do you believe that expanding federal control over intrastate waters will substantially interfere with the ability of individual landowners to use their property? If not, why not?

9. Since the Supreme Court's decision in Sackett v. EPA, the EPA has recognized that recipients of Clean Water Act compliance orders are entitled to immediate judicial review of the orders. If you are confirmed, will you ensure that EPA also recognizes that recipients of Clean Water Act jurisdictional determinations are also entitled to immediate judicial review?

Senator Jeff Sessions

1. I am informed that EPA is seeking to justify its proposed 316(b) rule, which would affect more than 1,260 power plants and industrial facilities nationwide, on the basis of a mail-in public opinion survey asking "how much" a random group of individuals would be "willing to pay" to reduce harm to fish at cooling water intakes. It is my understanding that this "willingness-to-pay" approach to determining "benefits" contrasts sharply with EPA's traditional approach used by EPA in its earlier 316(b) rulemakings and other rulemakings. The earlier analyses relied on actual market prices and costs incurred by individuals, rather than hypothetical questions in a public survey. It seems that this "willingness-to-pay" or "stated preference" survey is intended by EPA to increase the anticipated benefits of the proposed rule and justify costly controls, such as cooling towers. I am concerned that using unreliable benefit estimates could add unwarranted costs on power plants that could cause additional plants to shut down. I am informed that, in October 2010, NERC issued a report concluding that 316(b) could have economic impacts nearly three times greater than the combination of the Cross State Air Pollution Rule and the Mercury and Air Toxics Standards. *See NERC, 2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations (October 2010).* Given these concerns, would you support withdrawing the "willingness-to-pay survey" and clarifying that the survey and its results are inappropriate to use in justifying the final rule or requirements at individual facilities?

2. I am informed that, in EPA's proposed 316(b) rule, EPA has adopted starkly different approaches to managing "impingement" and "entrainment" at existing cooling water intake structures. For *entrainment,* it is my understanding that EPA adopted a site-specific approach, recognizing that (a) existing facilities already have measures in place to protect fish, (b) further measures may or may not be needed, and (c) the costs, benefits, and feasibility of such measures have to be evaluated at each site. This seems appropriate. Yet for *impingement,* I am told that EPA adopted rigid, nationwide numeric criteria that appear unworkable and in many cases unnecessary. In a notice of data availability issued last year, EPA signaled that it would consider a more flexible approach for impingement. In the final rule that is due this fall, would you support replacing the original impingement proposal with a more flexible approach that pre-approves multiple technology options and allows facility owners to propose alternatives to those options if the costs of additional measures would outweigh benefits?

3. During Administrator McCarthy's confirmation process, I expressed concerns about EPA's continuation of efforts to establish effluent limitation guidelines (ELG) for coalbed methane (CBM) production. In her responses to my QFRs, she wrote: "I understand the importance of your questions to natural gas producers in Alabama and elsewhere. I have not been directly involved in this CWA issue, but if confirmed, I look forward to working with you as EPA looks at this important issue under the CWA." Do you, also, commit to work with me and my staff on this issue and to keep us closely apprised of all EPA actions on this matter?

4. As outlined in my letter to the EPA dated May 10, 2012, the ELG process, which started in 2008, cannot be justified in light of prevailing economic conditions and the price of natural gas in today's market. Natural gas prices are much lower now than in 2008 when EPA started this process. Moreover, I am advised that there is no need for these ELGs because Alabama has successfully managed the National Pollutant Discharge Elimination System (NPDES) for more than 25 years with EPA regional supervision, and that an ELG is even less necessary now because of decreased gas and water production. A CBM ELG would threaten production across the country and could even end production in Alabama, thereby harming the great progress this country has made toward energy independence and progress in domestic natural gas production. I appreciate EPA's response dated June 12, 2012, that acknowledges the ELG must be economically achievable. The EPA has been working on a proposed rule regarding effluent limitation guidelines (ELG) for CBM since 2008. During that time, natural gas prices have decreased significantly. I am told that this dynamic renders a CBM ELG economically unachievable. Rather than devoting additional time and resources to an effort that the EPA cannot justify- economically or on the merits- I encourage you to abandon any efforts to establish a CBM ELG. Please provide an update on this process. Does EPA intend to continue this ELG process even though EPA acknowledges that it cannot issue new guidelines if they are economically unachievable? What are the costs to EPA of the entire ELG process for coalbed methane? I am told that EPA has actively been working on the CBM ELG since 2007 including an extensive survey of companies and that, to date, no economic information has been provided to the public even though the Clean Water Act requires an economic feasibility test. When can stakeholders expect to see such an analysis?

Senator Roger F. Wicker

1. What do you think the geographic scope for the award of RESTORE Act funds should be and why?

2. How much control do you think the States should have over the selection of projects for the 35% of Gulf Coast Restoration Trust Fund contents that are to be divided among the Gulf States?

Senator John Boozman

1. As you know, the EPA has inappropriately released personal and confidential business information relating to concentrated animal feeding operations (CAFOs) to certain activist organizations. ***(Amanda Peterka, EPA probes release of CAFO data to enviro groups, Mar. 6, 2013, http://www.eenews.net/Greenwire/2013103106/archive/2?term=EPA+probes+release+of+CAFO+data+to+enviro+groups*** **Earlier this year, I asked the EPA whether Arkansans were directly impacted by the Agency's careless disregard for legitimate privacy concerns during this incident. The Agency responded that "Arkansas is one of the 19 states for which the data was either: (1) available to the public on websites, (2) is subject to mandatory disclosure under state or federal law, or (3) does not contain data that implicated a privacy interest; the data from these nineteen states is therefore not subject to withholding under the privacy protections of FOIA Exemption 6." This implies that Arkansans were directly impacted, but it leads to further questions and concerns. The EPA seems to claim that there was no legal obligation to keep the Arkansas-related information confidential. Even so, the release of this information to activist groups inappropriately paints a target on Arkansans. As you know, the Department of Homeland Security had previously informed the EPA that the release of such information could constitute a domestic security risk. Would you please explain your views on (1) whether it was appropriate for the Agency to release the personal and confidential business information of Arkansans to activist organizations, (2) whether the agency could have met its FOIA obligations in this case without directly releasing Arkansas-related information to activist organizations?**

2. For many years, Congress has required EPA to support partnerships with non-federal entities, like the Water Systems Council, that help sustain safe drinking water sources for rural Americans who rely on groundwater. Please describe your views regarding the EPA's role in providing support for improved water quality and water systems to rural communities. Specifically, please address the EPA's role in supporting programs that provide training and technical assistance to citizens and communities that rely on individual water wells and small water well systems.

3. I'm sure you're familiar with OMB circulars that are provided to instruct agencies on the proper way to carry out regulatory analysis. For example, OMB Circular A-4 states that "a real discount rate of 7 percent should be used as a base-case for regulatory analysis." This circular also states that "analysis of economically significant proposed and final regulations from the domestic perspective is required, while analysis from the international perspective is optional." Do you believe it is important for agencies to follow OMB instructions to ensure that regulatory analysis is conducted in a consistent manner?

4. In assessing the benefits and costs of a regulatory policy, do you believe that EPA should evaluate domestic costs and domestic benefits separately from global/international costs and benefits? In other words, do you think standard practice should be to separate out the benefits to and costs to American citizens of a particular

regulatory policy, so that those costs and benefits can be independently evaluated?

5. This Committee has heard testimony this year-from both scientists and policy-makers-that narrative nutrient criteria, properly structured, can effectively protect water quality to meet designated uses. If confirmed, would you seek to use EPA power or resources to impose numeric nutrient criteria on states? Of, if confirmed, would you support EPA cooperation with states that would prefer to maintain narrative nutrient criteria?

6. As you know, EPA Region 6 is working on the Illinois River Watershed Modeling Project with a possible TMDL process to follow in Arkansas and Oklahoma. Earlier this year, the States of Arkansas and Oklahoma signed a Second Statement of Joint Principles and Actions. This bi-state agreement provides a three-year extension of existing commitments-which have led to significant decreases in flow-adjusted monthly phosphorous loads over time-while the states jointly perform a stressor-response study, funded by the State of Arkansas and managed by a committee appointed, in equal numbers, by each state. The States of Arkansas and Oklahoma agree to be bound by the findings of the Joint Study. Specifically, Arkansas agrees to fully comply with the standard at the state line, whether the existing standard is confinned or a new standard is established. Given this bi-state agreement, Senator Pryor, Congressman Womack, and I have urged the EPA to continue working on the model but to also postpone TMDL development until after the joint statement obligations are completed. Do you have any thoughts on this approach? And will you agree to work closely with our state officials on these types of issues?

7. Some activists seek to use Office of Water programs to address climate change by, for example, urging that resources be set aside for "green" water projects that reduce emissions. Do you believe that reduced emissions should be a higher priority for the Office of Water than clean water? Specifically, if forced to choose, would you rather spend limited resources on more- expensive projects that result in fewer emissions but also reduce water quality improvement capacity, or would you rather stretch tax dollars further to maximize the quantity and effectiveness of water quality protection infrastructure?

8. Too often the EPA takes actions that lead to distrust in rural farming communities. While most farmers want to be good stewards of land and water, they often distrust government programs, even voluntary programs, and rightfully so. EPA can make choices that seriously impact rural participation in voluntary conservation and environmental protection efforts. For example, hypothetically speaking, in helping to set-up voluntary nutrient trading programs, EPA could choose to support non-point source reduction verification through USDA-led (or state agricultural agency-led) verification of the implementation of best management practices by non-point sources that choose to participate. Or, EPA could choose to push for site-specific, "on-field" water quality monitoring. What are your thoughts on these issues, and what steps would you take to earn trust in rural and agricultural communities?

9. Will you initiate any interagency communications or coordination with USDA and other federal and state entities to ensure that the costs and burdens on American fanners and rural communities are fully considered by the EPA? If so, please describe any permanent protocols or practices that you would put in place to ensure that such communication and coordination continues throughout your tenure.

10. If confirmed, you will receive periodic oversight letters from the Environment and Public Works Committee. As the Ranking Member of the Water and Wildlife Subcommittee, I suspect that I will send you letters seeking information that is critical to the formulation of public policy. This oversight is critical as we seek to evaluate the effectiveness of government programs and policies, as we work to identify and eliminate wasteful government practices, and as we labor to eliminate fraud, corruption, abuse, and other forms of misconduct. Please describe your views regarding the importance of timely responses to legislative branch inquiries. If confirmed, what will you do to ensure that you and your office respond in a thorough and timely manner to legislative branch inquiries? Please be specific.

Senator Deb Fischer

<u>Prior Converted Cropland</u>

In response to one of my questions at your confirmation hearing, you stated, if a farmer changed the use of his or her prior converted cropland (PCC) from an agricultural to a non-agricultural use, the new use would need to fall under one of the Clean Water Act (CWA) 404(f) agricultural exemptions to avoid the need for a CWA permit. I believe your response is not consistent with EPA and Corps regulations or with judicial precedent.

In 20 I 0 and 2011, the U.S. District Court for the Southern District of Florida vacated a nationally-applicable guidance issued by the Corps's Headquarters claiming that once PCC is converted from an agricultural use to a non-agricultural use, it ceases to be excluded from the CWA. In vacating the guidance, the court deemed the guidance to be in direct conflict with the EPA's and Corps's 1993 rule excluding PCC from the CWA because the rule's preamble provided that PCC remains PCC (and thus excluded from CWA requirements) regardless of use. In fact, the position explained by the joint EPA/Corps preamble was in response to a direct comment from the public asking whether a change in use results in the loss of PCC classification. The court concluded the guidance was a nationally applicable legislative rule promulgated without following the Administrative Procedure Act (APA). Unhappy with the court's ruling, the Corps sought to amend the judgment in 2011 in order to apply the guidance on a case-by-case basis. The court, again, instructed the Corps that it was not to make any wetlands determinations inconsistent with its prior order unless it changes the 1993 rule following APA notice and comment rulemaking procedures. The Corps did not appeal the decision. Both the 2010 and 2011 court orders are attached for your review.

1. Is EPA adhering to the district court ruling that enjoins the Corps from applying the "change in use" guidance nationwide? If not, please explain why?

2. If EPA is not adhering to the district court ruling, please explain to me what EPA's position is regarding the regulatory status of PCC that is converted to a non-agricultural use? Is EPA's position the same as the position you took at your confirmation hearing? Is it EPA's position that upon changing the use of prior converted cropland from an agricultural to a non-agricultural use, that land no longer qualifies as prior converted cropland and can be considered a "water of the United States" absent another exemption?

3. Will you commit to me that, if confirmed, EPA will not take a position that is different from the district court ruling discussed above unless and until EPA and the Corps change the 1993 rule following notice and comment rulemaking?

4. If you will not make such a commitment, please explain to me what authority EPA has to deviate from the position adopted in the 1993 rule.

5. Does EPA have any plans to adopt further guidance or go through a rulemaking to change the 1993 rule in order to impose a "change in use" limitation on the PCC exemption?

6. Do agricultural ditches on cropland that is PCC also qualify PCC?

<u>EPA's National Rivers and Streams Assessment</u>

Thank you for committing to me that, if confirmed, you will ask EPA staff to relook at the way to set the benchmark when conducting the National Rivers and Streams Assessment. You also indicated that the assessment is intended to address the question of "how well are we doing." To understand the approach you will take on this issue if confirmed as the Assistant Administrator, please respond to the following questions:

7. I believe the mission of EPA's Office of Water is to implement statutes enacted by Congress, including the Clean Water Act. Do you believe the Office of Water has other missions not authorized by statute?

8. In your view, is it appropriate for EPA's Office of Water to measure "how well we are doing" implementing the Clean Water Act by evaluating the condition of waters against a benchmark of streams that are least disturbed by human activity?

9. Do you consider it to be the mission of EPA's Office of Water to return rivers and streams to conditions that existed before human activity?

10. The objective of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

Do you believe the Clean Water Act objectives under section 101(a) are a grant of authority to EPA to take actions to further those objectives, or do you believe EPA can implement the Clean Water Act only through specific authorities granted in other sections of the Act?

11. Do you agree that successful protection and maintenance of water quality is determined under the Clean Water Act by evaluating whether a water body is achieving water quality standards established by states and approved by EPA, which include a use designation and criteria to protect those uses?

12. Has a state designated any water body with the use of "least disturbed by human activity"?

13. Absent any water quality standards established to protect and maintain a use of "least disturbed," do you believe it is appropriate for the Office of Water to evaluate its success in implementing the Clean Water Act by assessing water bodies based on whether they match the conditions of "least disturbed" waters?

14. If you believe it is appropriate to conduct a National Rivers and Streams Assessment for a purpose other than implementation of the Clean Water Act, please identify your authority to expend federal dollars to conduct this assessment.

<u>Science Advisory Board Panel on Water Connectivity</u>

In March 2013, EPA requested public nominations of scientific experts to form a Science Advisory Board (SAB) panel to review the agency's draft science synthesis report on the connectivity of streams and wetlands to downstream waters.

15. What is the status of the nomination process?

16. Will EPA commit to including individuals nominated by agricultural, industry, and property rights representatives in order to ensure that the agency lives up to its promise of balanced SAB review panel?

17. Specifically, will EPA include the seven individuals Agricultural Retailers Association recommended to Dr. Thomas Armitage on June 7, 2013?

<u>Immediate Judicial Review of Jurisdictional Determinations</u>

18. EPA has recognized those who receive Clean Water Act compliance orders are entitled to immediate pre-enforcement judicial review under Administrative Procedure Act and the Supreme Court's decision in Sackett v. EPA. Given that jurisdictional

determinations are similar to compliance orders in that they mark the agency's definitive ruling on Clean Water Act jurisdiction, obligate recipients to go through Clean Water Act permitting for discharges into "navigable waters," and fix the legal relationship between recipients and the EPA, will you recognize if confirmed that a property owner is entitled to immediate judicial review of jurisdictional determinations?

State Revolving Funds

19. I have been advised that if the annual Congressional capital grants to the Clean Water and Drinking Water State Revolving Funds (SRFs) are reduced to zero, the collective corpuses of the SRFs will diminish by 30% in 10 years. What is EPA's and the Administration's long-term plan and proposal for maintaining SRF capital grants to states on an annual basis, consistent with the policy of Section 101(a)(4) of Clean Water Act, to provide assistance to local governments with the huge costs to comply with federal combined sewer overflows and wastewater facility requirements?

Water Quality Standards Rulemaking

20. It is understood that EPA has requested permission from the Office of Management and Budget to amend the agency's Water Quality Standard Regulations set forth in 40 CFR Part 131. What are the topics of that proposed regulation?

Effluent Limits for Storm Water Permits

21. Is EPA planning to propose regulation of municipal separate storm sewer flow amounts and numeric effluent limits for pollutants? If so, what is EPA's statutory authority to consider regulating such flows and numeric effluent limits for pollutants?

Consent Decrees

22. Section 402 of the Clean Water Act authorizes and directs the issuance of NPDES permits for discharges to the nation's waters. Such permits act as shields against EPA and state enforcement and citizen lawsuits so long as the permittee remains in compliance with its permit. In light of this, what is EPA's authority for requiring civil consent decrees in lieu of, or in addition to, NPDES permits for publicly treatment facilities, combined sewer overflows, and municipal separate storm sewer systems? Further, what is the authority for EPA insisting on civil consent decrees to implement green infrastructure by local governments?

Spill Prevention. Control, and Countermeasure (SPCC) Plans

EPA officials have said farmers and ranchers need to determine if fuel storage on their farm and ranchers "would reasonably be expected" to discharge oil into waters of the United States. If so, they are then subject to the rule. But when questioned, EPA officials have refused to further define the term "reasonably be expected" and only say

farmers and ranchers should consider a worst case scenario.

23. Could you help my constituents by better defining when a "reasonable expectation" exists?

24. If a farmer determines a reasonable expectation for a spill to reach waters does not exist, what criteria will EPA use to evaluate whether it agrees with a farmer's determination?

25. What certainty do farmers and ranchers have that their determinations will be agreed to by EPA if inspected? (Nebraska Farm Bureau has heard from a member near Valentine who is 300 yards from the nearest ditch and miles away from the nearest stream; should that farmer "reasonably expect" a spill to enter a water of the U.S.?)

26. Does agriculture have a history of large oil or fuel spills?

a. If not, why did EPA seek to include farms and ranches in the SPCC regulation?

b. Can EPA justify the possibly significant compliance cost to farmers and ranchers given the lack of history of spills?

27. Because of the SPCC regulation, I have heard farmers and ranchers are now buying smaller fuel tanks to avoid the high cost of compliance. The smaller tanks mean fuel delivery personnel would likely need to deliver fuel more often (at a higher cost to the farmer) to meet the needs of their customers. Would you agree that large fuel trucks making more trips and spending more time on the road not only increases the potential for a spill from those trucks, but also increases the environmental impacts because of the increase in time spent on the road?

<u>Duplicative Pesticide Permits</u>

28. I would like to address the duplicative permitting requirement for pesticide applications. As you know, Clean Water Act permits are now required for certain pesticide applications that are already safely governed under the Federal Insecticide, Fungicide, and Rodenticide Act. I understand EPA has provided technical assistance to Congress on legislation to address this issue, and I hope the agency will continue to work cooperatively with Congress on this matter. If you are confirmed, will you support efforts to reduce the duplicative permitting requirement for pesticides?

<u>CAFO Clean Water Act Permits for "Dust and Feathers"</u>

It is my understanding EPA has been issuing enforcement orders compelling livestock and poultry farmers to seek a federal Clean Water Act permit for small, incidental amounts of dust, feed, feathers, and manure on the farmyard that could be washed away by rainwater, even if the farm is located a long way from any stream.

I want to be clear; I am not referring to manure piles or the production area where feed and animals are kept or manure storage facilities. The regulatory action in question relates to incidental amounts of feathers and dust blown from ventilation fans, or very small amounts of manure that can be tracked on a boot or tire and are commonly found on all farms.

29. Do farmers have to worry about controlling rainwater that falls on their barnyards that may carry very small amounts of pollutants into waters?

30. Do small amounts of dust, feathers, and manure found on any livestock farmyard require a federal permit when washed by rain into a stream?

31. Why isn't that just ordinary agricultural stormwater that is common to all farms and specifically exempted from regulation by the Clean Water Act?

32. Do farmers need to fear that, as Assistant Administrator, you intend to require federally mandated permits to regulate farm dust?

EPA 820-R-14-006

United States
Environmental Protection
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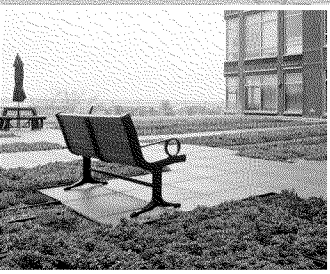
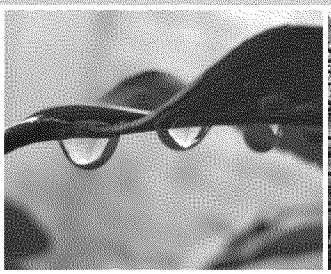
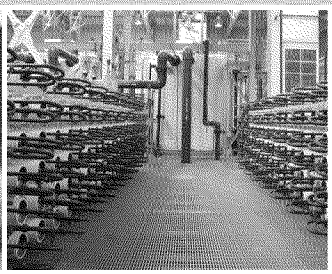

Promoting Technology Innovation for Clean and Safe Water

Water Technology Innovation Blueprint—Version 2

U.S. Environmental Protection Agency
Office of Water

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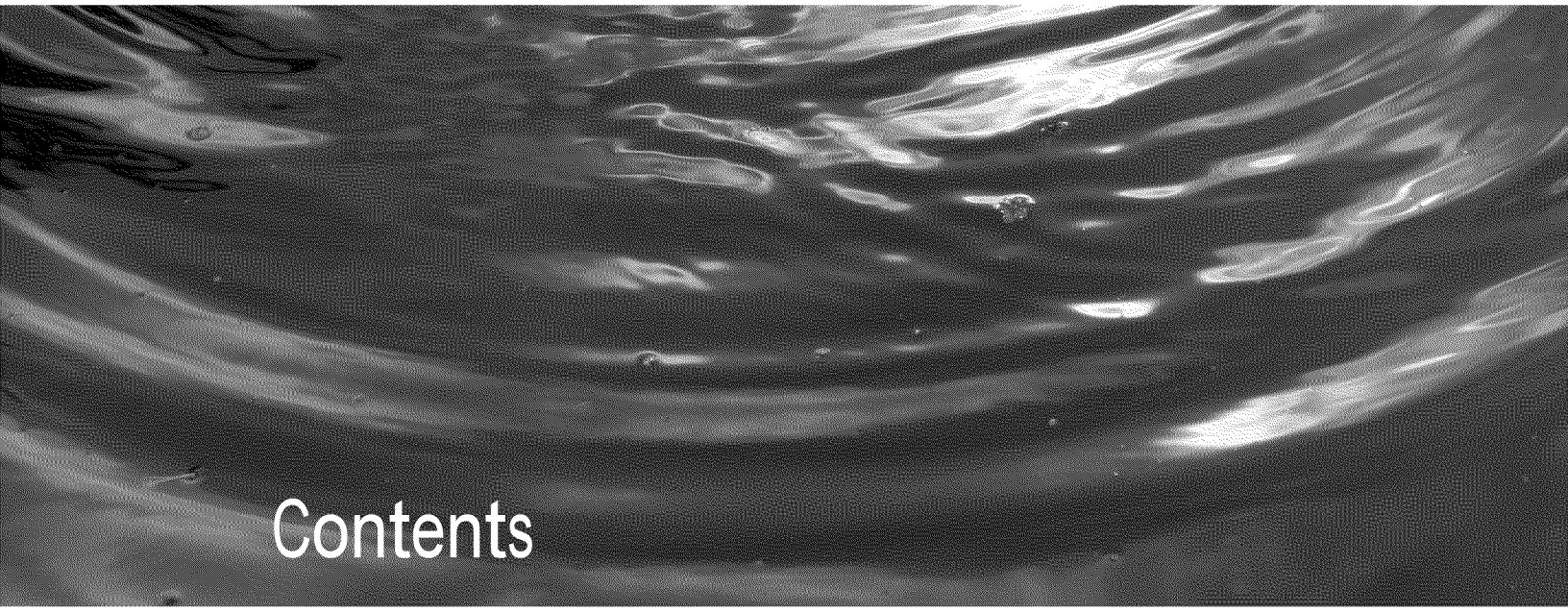

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Overview

Our freshwater resources are limited and face mounting pressures from drought, flooding,pollution, population growth, and competition from many uses (e.g., ecosystem protection, drinking water, agriculture, energy production, recreation). Technology innovation can help address our water challenges and put us on a more sustainable path while supporting economic growth. The U.S. Environmental Protection Agency (EPA) aims to be a catalyst to promote and support technology innovation to protect and ensure the sustainability of our water resources.

On March 27, 2013, EPA's Office of Water issued the *Blueprint for Integrating Technology Innovation into the National Water Program*, which highlighted EPA's initial ideas and plans for advancing technology innovation across various water programs. This document expands on those ideas and frames the business case for water technology innovation; identifies "market opportunities" where technology innovation could help solve water challenges; provides examples of emerging innovation pioneers; identifiestools for assessing water risk; and frames a more robust set of actions that EPA will take to promote technology innovation for clean and safe water.

In the past year, EPA has widely communicated the goals and opportunities of the technology initiative, engaging a broad spectrum of partners and stakeholders. For example, Acting Assistant Administrator for Water Nancy Stoner has visited many innovation pioneers to raise awareness of very promising effortsto solve water resource challenges cheaper, faster and using less energy. Effortsto promote and foster technology innovation will continue to be dynamic and evolving.

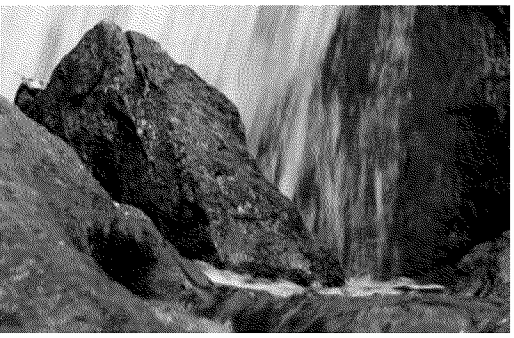
For purposes of this document, technology innovation is definedas:

> *The development and deployment of new technologies and processes; new applications of existing technology; production changes; and organizational, management and cultural changes that can improve the condition and sustainability of our water resources.*

In short, this includes: (1) new technologies; (2) new management approaches (e.g., regional coordination); or (3) techniques that increase the efficiency of existing systems (e.g., sensors and controls).[1]

"Technology innovation can accelerate progress toward our goals of clean and safe water. EPA and many stakeholders will strive to support technology innovation to solve water resource problems… cheaper, faster and using less energy!"

—EPA Acting Assistant Administrator for Water Nancy Stoner



The Business Case for Technology Innovation for Water

> "Despite consistently growing public awareness and recognition, water continues to be under-appreciated and undervalued. We need fundamental change in the way we manage, utilize and view our finitewater resources."
>
> —From the TechKNOWLEDGEy Strategy Group's *2013 Water Market Review: Growing Awareness, Growing Risks,* 2013[2]

Clean and safe water is essential for public health and healthy ecosystems, for the nation's economic well-being, and for the welfare of our families and communities. In the United States, a significantamount of water is used every day. For example, in 2005 almost 330 billion gallons of freshwater was withdrawn for use:

- 29.4 billion gallons per day was withdrawn for domestic use.
- 19.2 billion gallons per day was withdrawn for industrial and mining use.
- 138.8 billion gallons per day was withdrawn for use in farming (including agricultural and horticultural irrigation, livestock, and aquaculture).
- 142 billion gallons per day was withdrawn to produce energy in thermoelectric power plants.[3]

Water, uses of water resources, and the services to provide clean water play a significantrole in economies around the world. For example, the value of the global water market—control and cleanup of water—is estimated at $500 billion per year.[4] Many aspects of the U.S. economy also depend on large supplies of water:

- In 2012, the total revenue for the domestic U.S. water and wastewater industry was $139 billion.[5]
- In 2011, 44 million anglers spent $48 billion to fishin U.S. waters.[6]
- In 2007, irrigated crops accounted for 55 percent of the total value of U.S. crops.[7]
- In 1999, the beverage industry used 12 billion gallons of water to produce $58 billion worth of products.[8]

Water Resource Challenges in the United States and Globally

Water resources in the United States and globally are facing many challenges—both in quality and quantity—due to a number of growing issues, such as population growth, development and climate change. Innovative technologies offerthe promise to address these chal - lenges more cost-effectively and expeditiously.

Water Scarcity: Aquifers are being depleted at a much higher rate than natural precipitation and ground water recharge is refillingthem. As of February 2014, over 36 percent of the continental U.S. is experiencing moderate to severe drought conditions.[10] A fifthof the world's people, more than 1.2 billion, live in areas of physical water scarcity.[11] Some predict that half of the world's population will live with chronic water shortages by the year 2050.[12]

Water Quality: Many of the nation's coastal waters, estuaries, rivers, streams and lakes remain impaired as a result of pollution and/or physical alterations. For example, according to the 2008–2009 EPA National Rivers and Streams Assessment (NRSA), 55 percent of the nation's river and stream miles do not support healthy populations of aquatic life, with phosphorus and nitrogen pollution being just one of the problems.[13] Increases in population and land development present additional challenges such as increased storm-water runofffrom impervious surfaces. Declining source water quality poses challenges for conventional water treatment plants in meeting drinking water standards.

Aging Infrastructure: America's water and waste-water infrastructure is aging. The American Society of Civil Engineers gives the current water and wastewater

> "Water is an essential commodity: human life—and indeed all life on earth—depends upon it. Water is also a critical input to production in a number of economic sectors....Every sector of the economy is influenced in some way by water."
>
> — From EPA's *The Importance of Water to the U.S. Economy Synthesis Report,* 2013[9]

infrastructure a grade of "D."[15] There are an estimated 240,000 water main breaks per year in the United States. Assuming every broken pipe needs replacing, the cost over the coming decades could exceed $1 trillion.[16] Wastewater systems experience approximately 75,000 sanitary sewer overflowsannually, discharging 3 to 10 billion gallons of untreated wastewater, leading to some 5,500 illnesses due to exposures to contaminated recreational waters.[17] Estimates of costs for wastewater and stormwater needs exceed $298 billion,[18] while drinking water needs exceed $384 billion[19] over the next 20 years.

Climate Change Impacts: Climate change is exacerbating the challenge of protecting water resources, ecosystems and our water infrastructure. According to the EPA *National Water Program 2012 Strategy: Response to Climate Change,* the negative impacts on water resources take a variety of forms. Warmer air, warmer water and changes in precipitation patterns increase water pollution problems. More extreme weather events (e.g., flooding)can have devastating impacts on water and wastewater infrastructure and aquatic systems. Rising sea levels will alter ocean and estuarine shorelines, and the increased frequency, severity and duration of drought will affectpublic water supply, agriculture, industry and energy production uses. Warmer water and changing flowsalter aquatic biology. Many, or all, of these things combine to change the availability of drinking water.[20]

> "During the next 10 years, many countries important to the United States will experience water problems—shortages, poor water quality, or floods—that will risk instability and state failure, increase regional tensions, and distract them from working with the United States on important US policy objectives."
>
> —From the National Intelligence Council's *Global Water Security,* 2012[14]

Access to Water and Sanitation: About 783 million people worldwide do not have reasonable access to clean and safe water for consumption, and about 2.5 billion do not have access to basic sanitation.[21]

Tools to Assess Water Supply Risk and Vulnerability

A variety of tools has been developed for use by companies, utilities, planners and others to assess current and future water risks. With a greater understanding of the risks, these players then often seek technical or institutional innovation. Some examples of tools that address either water availability and/or water quality risks include:

> "In communities all around the world, water supplies are coming under increasing pressure as population growth, climate change, pollution, and changes in land use affectwater quantity and quality."
>
> —From the National Academy of Sciences' *Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater,* 2012[22]

- **Global Water Tool (World Business Council for Sustainable Development)**— Designed for companies and organizations to map their water use and then assess risks relative to their global operations and supply chains.
- **Aqua Gauge (Ceres)**—A way for companies to assess, improve and communicate their corporate-wide water risk management approach.
- **Watersketch Toolbox (Finnish Environment Institute)**— Offersinformation and practical tools and methods for sustainable river basin planning and management.
- **Local Water Tool (GEMI)**— Intended for companies and organizations to evaluate the external impacts, business risks, opportunities and management plans related to water use and discharge at a specificsite or operation.
- **CREAT, Climate Resilience Evaluation and Awareness Tool (EPA)**—Organizes available climate data and guides users through a process of identifying threats, vulnerable assets and adaptation options to reduce risk.
- **Aqueduct Water Risk Atlas (World Resources Institute)**— Intended for companies, investors, governments and communities to better understand where and how water risks are emerging around the world.
- **Sea Level Rise Tool For Sandy Recovery (NOAA)**— Provides a set of map services to help communities, residents, and other stakeholders consider risks from future sea level rise in planning for reconstruction following Hurricane Sandy.

An inventory of other water tools and their use, as well as other information, is available at http://water.epa.gov/infrastructure/watersecurity/techtools/index.cfm .

Market Opportunities for Technology and Institutional Innovation

Our water resource and sustainability issues represent market opportunities for technology and institutional innovation and to promote economic growth. Descriptions of the most pressing needs and promising opportunities are outlined below.

1. Conserving and Recovering Energy

Much of the country's water and wastewater infrastructure was constructed at a time when energy costs were low; therefore little was invested in energy efficiency or energy generation. Similarly, traditional agricultural practices could take advantage of opportunities for energy savings (e.g., more efficient drip irrigation systems) and nutrient recovery. Energy conservation and recovery in the water and agriculture sectors have significant promise:

- Approximately 2 percent of the nation's total energy consumption, (69.4 billion kilowatt-hours) is used for drinking water and wastewater treatment services.[24]
- Wastewater treatment plants have an estimated 400 megawatts (MW) of biogas-based electricity generating capacity and approximately 38,000 million Btu per day of thermal energy generating capacity.[25]
- AgSTAR estimates that there are 8,200 U.S. dairy and swine operations that could support biogas recovery systems, collectively able to generate more than 13 million MWh per year and displace about 1,670 MW of fossil-fuel-fired generation.[26]

> "The US has the potential to realize the benefits of advanced water and wastewater strategies on a national scale. Achieving this, however, will require engaging engineering, financial, and political leadership to crystallize an actionable national water agenda, strengthen the mechanisms that mitigate sector fragmentation and deliver a supportive policy framework."
>
> —From Ernst and Young's *The US Water Sector on the Verge of Transformation*, 2013[23]

Technology Innovation Challenge and Aspiration:

Imagine a future when water, wastewater and agricultural activities can cost-effectively generate as much energy as they consume!

2. Recovering Nutrients

Excess nitrogen and phosphorus is one of the leading causes of water pollution across the nation.[27] Point sources (e.g., municipal wastewater treatment facilities, concentrated animal feeding operations) and nonpoint

Innovation Highlight: Utility Harnesses Hydropower

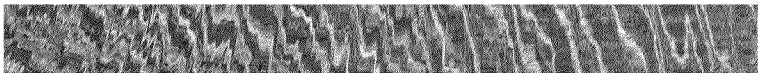
The Massachusetts Water Resources Authority (MWRA) harnesses energy via an in-line hydroelectric turbine and generator. The hydroelectric system extracts the kinetic energy of potable water as it travels down-gradient from the treatment plant to a network of tanks. MWRA's system has a capacity of 200 kilowatts, of which 25 percent is used onsite by the utility and 75 percent is exported back to the grid. More information can be found at http://www.mwra.state.ma.us/05energy/pdf/2012/011812-energystaffsummary.pdf .

Innovation Highlight: Dairy Farm Goes Energy Positive

Brubaker Farm, a 900-head dairy in Lancaster Country, Pennsylvania, captures methane from manure digestion and produces electricity to provide power to the farm and sell excess back to the grid, enough to power 150–200 homes. Waste heat from the generator heats water for the farm and is used to dry digested solids for bedding for cow comfort. More information can be found at http://www.usdairy.com/~/media/usd/public/brubakercasestudy.ashx .

Innovation Highlight: Utility Extracts Nutrients from Wastewater

The Hampton Roads Sanitation District (HRSD) Struvite Recovery Facility in Virginia recovers phosphorus from wastewater recycle streams. The recovered phosphorus is transformed at HRSD's Nansemond facility into a commercial fertilizer. More information can be found at http://www.ostara.com/sites/default/files/Ostara-Hampton-Roads-Case-Study.pdf .



Innovation Highlight: The Greening of Our Cities

Philadelphia established the Green City Clean Waters program in 2010. The city has removed 10,000 square feet of impervious paving and has begun installation of green street blocks throughout the city. Sixteen green school projects have been completed and private businesses are now engaged in approximately 300 greening projects. The city also has an incentive program for stormwater billing that grants a nearly 100 percent credit for green retrofits.More information can be found at http://www.phillywatersheds.org/what_were_doing/documents_and_data/cso_long_term_control_plan .

Onondaga County and the city of Syracuse's "Save the Rain" campaign began in 2009 and is a comprehensive plan to clean up and restore Onondaga Lake and its tributaries, including a strong outreach effort to educate the general public on ways to lessen the overflowof sewage into Onondaga Lake. The program includes construction of innovative gray and green infrastructure, including the War Memorial Arena, with a 15,000-gallon cistern system, the firstsystem in the country designed to use harvested rainwater for a hockey rink. One of the key elements of Save the Rain is transparency. Every project advanced through the program has a unique Web page where the public can review the project design elements, cost and stormwater capture objectives. More information can be found at http://savetherain.us/.

sources (e.g., agricultural activities, urban stormwater runoff,septic systems) contribute to nutrient pollution of surface and ground water. Approximately 14,000 water bodies are affectedby nutrient pollution throughout the United States.[28] Every state in the U.S. has nutrient-impaired waters that have the potential for serious health and ecological effects(e.g., harmful algal blooms, oxygen dead zones, unhealthy drinking water).[29]

Nutrient treatment and recovery technologies are being used at muncipal wastewater treatment plants, but implementation has been slow due to complexities in deployment, high energy use, and overall high costs. New techniques are needed to reduce and recover nutrients at substantially less cost and with a reduced carbon footprint.

*** Technology Innovation Challenge and Aspiration:**

Imagine if we could recover nutrients from human and animal wastes and convert them into marketable commodities before they negatively impact surface and ground water!

3. Improving and Greening Water and Wastewater Infrastructure

There is a critical need to rehabilitate the nation's water and sewer infrastructure, the costs of which are estimated at $682 billion ($384 billion for drinking water infrastructure[30] and $298 billion for wastewater and stormwater infrastructure[31]). There is an expanding array of technologies and models available for assessing, rehabilitating and retrofittingwastewater, drinking water and stormwater infrastructure; however, these advances are still insufficientto bridge the funding gap between projected infrastructure needs and anticipated investment in water sector utilities. Additional technological advancements and innovative infrastructure financingmethods are needed to reduce system failures and to extend the overall service life of water and wastewater systems. Green and natural infrastructure technologies hold significant promise as resilient and affordablesolutions.

*** Technology Innovation Challenge and Aspiration:**

Imagine if we could fundamentally improve our nation's infrastructure by vastly expanding the use of green technology to complement traditional grey infrastructure, then identifying creative financing options to achieve this transformation!

4. Conserving and Eventually Reusing Water

Competition for water resources and diminished resources because of drought are driving the need for water conservation, efficiencyand reuse. In order to create a more sustainable water future, cities and states

are encouraging water conservation as a way to reduce demand. Water reuse technologies have also been implemented in numerous locations in the United States and throughout the world. For example, Israel reuses 70 percent of its domestic wastewater.[32]

In light of growing populations and climate change, conserving water can help communities meet future needs. Many technologies exist to help consumers save water in the home and office. In addition, with the need for water infrastructure upgrades and replacements estimated at hundreds of billions of dollars, technologies that help water utilities reduce water loss, fix leaks and prioritize main replacement not only improve water efficiency but can also mitigate some portion of those costly infrastructure needs.

Technologies currently exist to provide treatment for varying levels of water reuse such as irrigation, industrial use, gray water applications, and indirect and direct potable reuse. There is a vast potential for additional technology development and application to conserve and reuse water resources. The nation's 15,000 municipal wastewater facilities discharge approximately 32 billion gallons of water every day.[33] Water reuse and repurposing can serve to reduce pressure on other sources of fresh water, such as ground water (which 44 percent of the population depends on for drinking water).[34]

Innovation Highlight: The World's Largest Potable Reuse System

The Ground Water Replenishment System (GWRS), operated by the Orange County Water District, is the world's largest planned indirect potable reuse project. The system recycles treated wastewater from the Orange County Sanitation District using a three-step purification process to produce a near-distilled-quality water that exceeds all state and federal drinking water standards. Operational since January 2008, this state-of-the-art water purification project produces 70 million gallons per day, which is enough water to meet the needs of nearly 600,000 residents in north and central Orange County, California. Each day, approximately 35 million gallons of the GWRS water are pumped into injection wells to create a seawater intrusion barrier, and another 35 million gallons are pumped into the district's percolation basins in Anaheim, where the water naturally filters through sand and gravel to the deep aquifers of the ground water basin. More information can be found at: http://www.gwrsystem.com/the-process.html .

Innovation Resource: EPA WaterSense Program Saves Water

WaterSense, a partnership program by EPA, is helping to sustain and protect the nation's water supply by fostering the development and use of water-efficient products, new homes and services. WaterSense brings together a variety of stakeholders to promote the value of water efficiency, encourage innovation in manufacturing, and decrease water use and reduce strain on water resources and infrastructure. More information can be found at http://www.epa.gov/watersense/index.html .

Technology Innovation Challenge and Aspiration:

Imagine if we could increase water reuse to support the water needs of our burgeoning population!

5. Reducing Costs and Improving Techniques for Water Monitoring

Newer monitoring technologies, such as improved water quality sensor technology, remote sensing and satellite imagery, hold opportunities to generate substantially more data at lower cost. New sensor technology coupled with improved telemetry and information technology can make data on water quantity and water quality available for a broader range of applications. Sensor and laboratory advances also provide opportunity for reducing the overall cost of water quality monitoring. New tools are being developed to store, communicate, analyze and visualize the vast data streams. Currently, less than 30 percent of the nation's surface water bodies are assessed by EPA, states or tribes, partly because of the high cost of traditional fixed-station water quality monitoring.

Technology Innovation Challenge and Aspiration:

Imagine collaborative monitoring efforts that provide low-cost, watershed-scale, real-time data on water quality and quantity that facilitate protection and wise use of our water resources!

6. Improving Performance of Small Drinking Water Systems

Small drinking water systems consistently provide safe, reliable drinking water to their customers; however, many small systems also face a number of challenges:

Innovation Highlight: Proliferation of Remote/Continuous Monitoring

The National Great Rivers Research and Education Center (NGRREC) is working to create a network of monitoring buoys for real-time, continuous water quality data on the Mississippi, Missouri and Illinois Rivers. More information can be found at http://www.ngrrec.org/ .

Researchers at Clemson University are building the "Intelligent River" to provide real-time monitoring, analysis and management of water resources. More information can be found at http://www.clemson.edu/public/ecology/ .

Wireless Waterway is a project commissioned by the Port of Pittsburgh that will use the latest monitoring and information technology to manage the water resources in real time so commerce and recreation along the Pittsburgh Waterfront are easier for everyone. More information can be found at https://www.wirelesswaterways.com/ .

The JeffersonProject is a collaborative effortbetween Rensselaer Polytechnic Institute, IBM and the FUND for Lake George (New York) to develop a lake environmental monitoring and prediction system to provide a real-time understanding of lake health. More information can be found at http://fundforlakegeorge.org/solutions/the-jefferson-project .

The Hudson River Environmental Conditions Observing System (HRECOS) is a network of real-time monitoring stations on the Hudson River Estuary. HRECOS is a collaborative effortbetween multiple agencies, including the New York State Department of Environmental Conservation, USGS and NOAA, among others. More information can be found at http://www.hrecos.org .

The River and Estuary Observatory Network (REON) is an effortbetween Clarkson University's Beacon Institute for Rivers and Estuaries and IBM to use real-time monitoring technologies to better understand the Hudson River ecosystem from the headwaters in the Adirondack Mountains to the ocean. More information can be found at http://www.bire.org/river-and-estuary-observatory-network/ .

- Over 94 percent of the more than 156,000 public water supply systems are small, each serving fewer than 10,000 people. [35]
- In its fifthreport to Congress in 2011, EPA identifieda total infrastructure need of $64.5 billion for small drinking water systems throughout the country.[36]
- Very small drinking water treatment systems (serving fewer than 500 people) have the highest percentage of health-based violations of all system sizes (74 percent).[37]

A 2006 report from EPA's Inspector General[38] identified these challenges as: (1) lack of financialresources, (2) aging infrastructure, (3) difficultiesobtaining financial assistance, (4) cost of scale, (5) management limitations, (6) lack of long-term planning, (7) system operator issues, and (8) challenges with understanding and/or compliance with regulations.

Technology Innovation Challenge and Aspiration:

Imagine the deployment of new cost-effectiveand affordabletechnologies that substantially improve the technical and financialcapacity of small drinking water systems!

Innovation Highlight: Use of Gray Water as Makeup for Cooling Towers

The Public Service Enterprise Group's Linden Generating Station does not currently employ a cooling water intake structure. Instead, the Linden Generating Station uses reclaimed wastewater from the nearby Linden Roselle Sewerage Authority (LRSA) for all its cooling water needs. Approximately 4 of the 11 million gallons per day of treated wastewater from LRSA is pumped to the Linden Generating Station. After being used for cooling, any remaining water (e.g., cooling tower blowdown) is pumped back to LRSA for treatment again. More information can be found at http://www.pseg.com/info/environment/ps_caring.jsp .

7. Reducing Water Impacts from Energy Production

Vast amounts of water are used each year for energy production in the United States. A considerable amount of water is used to cool thermoelectric power plants, grow feedstock and produce biofuels, and extract oil, coal and natural gas. Further, the polluted water discharges from

Innovation Resource: National Center for Innovation

The EPA Office of Research and Development (ORD) recently sought applications to establish a National Center for Innovation in Small Drinking Water Systems. The Center will research and develop innovative and sustainable technologies and approaches to improve the sustainability of small systems. More information can be found at http://www.epa.gov/ncer/rfa/2013/2013_star_drinkingwater.html.

Innovation Resource: CREAT—A Tool for Improving Resiliency

EPA has developed the Climate Resilience Evaluation and Awareness Tool (CREAT), a software tool to assist drinking water and wastewater utility owners and operators in understanding potential climate change threats and in assessing the related risks at their individual utilities. CREAT provides users with access to the most recent national assessment of climate change impacts for use in considering how these changes will impact utility operations and missions. CREAT allows users to evaluate potential impacts of climate change on their utility and to evaluate adaptation options to address these impacts using both traditional risk assessment and scenario-based decision-making. More information can be found at http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm.

energy production poses difficult challenges for effective management.

Opportunities exist for innovative solutions to not only alleviate the potential water quality impacts from energy production activities, but also provide for more efficient and cost-effective energy production. For example, beneficial reuse of produced water may be an attractive opportunity for oil and gas production wells located in water-scarce regions, where limited freshwater resources exist and the potential costs for produced water discharge are high.

*** Technology Innovation Challenge and Aspiration:**

Imagine the United States continuing its journey toward securing energy independence without threat to surface or ground water quality and quantity!

8. Improving Resiliency of Water Infrastructure to the Impacts of Climate Change

In 2012, Super Storm Sandy affected approximately 60 million people and caused approximately $50 billion in damage, primarily across the Northeast. Affecting more than 690 drinking water and wastewater utilities, it showed how vulnerable our water infrastructure can be to extreme weather/climate events. With almost $600 million of funding provided by Congress, EPA is working with the states of New York and New Jersey to build new, more resilient infrastructure.

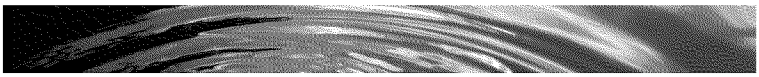
On November 1, 2013, President Obama issued an executive order that prompts actions to enhance the nation's

Innovation Highlight: Adapting to Climate Change and Water Reuse

The Emerald Coast Utilities Authority (ECUA) saw its Main Street Wastewater Treatment Plant inundated by Hurricane Ivan in 2004. With the help of funding from FEMA and other sources, the treatment plant was replaced and located outside the city of Pensacola and away from the coastal plain. The Central Water Reclamation Facility was rebuilt using treatment technology that can enable the reuse of 100 percent of the nearly 22.5 million gallons per day (average flow) treated at the facility. More information can be found at http://www.ecua.fl.gov/services/wastewater-services.

Innovation Highlight: Reinventing the Toilet

The Bill and Melinda Gates Foundation challenged universities to design toilets that capture and process human waste without piped water, sewer or electrical connections, while capturing useful resources. The Foundation's Water Sanitation and Hygiene Program strives to spur change to improve worldwide drinking water while reducing sanitation-related problems. More information can be found at http://www.gatesfoundation.org/What-We-Do/Global-Development/Water-Sanitation-and-Hygiene.



Innovation Highlight: Using Roleplaying to Manage Watersheds

The University of Virginia (UVA) Bay Game is a computerized simulation based on the Chesapeake Bay watershed. The watershed simulation allows players to take the roles of stakeholders, such as farmers, developers, watermen and local policy-makers, and make decisions about their watershed. More information can be found at http://www.virginia.edu/vpr/sustain/BayGame/about/ .

preparedness and resilience to extreme events and climate change. The increasing occurrence of extreme events, such as floods,drought and storm surge, underscores the need to utilize new technologies for planning how and where to rebuild existing or build new infrastructure with greater resiliency.

Technology Innovation Challenge and Aspiration:

Imagine if we could protect our water infrastructure from the effectsof extreme weather and climate change!

9. Improving Access to Safe Drinking Water and Sanitation

Despite technological advances on many fronts, hundreds of millions of people worldwide still lack access to the most basic of needs—clean drinking water and sanitation facilities.

- In 2011, approximately 768 million people worldwide (more than twice the population of the United States) relied on unimproved drinking water sources with significantthreats of contamination. [39]
- At the end of 2011, 2.5 billion people worldwide lacked access to improved sanitation facilities[40] and more people had a mobile-cellular phone subscription than a toilet.[41]

Technology Innovation Challenge and Aspiration:

Imagine if access to safe drinking water and sanitation practices—basic human needs—were no longer responsible for deaths and illness worldwide!

10. Improving Water Quality of Our Oceans, Estuaries and Watersheds

Less than half of the nation's lakes, rivers, streams and coastlines achieve a level of quality to safely allow for their intended uses (e.g., potable water supply, ecosystem protection, swimming, fishing).Similarly, ocean waters and the nation's ground water are also vulnerable to pollution and experiencing impacts from anthropogenic sources.

Because watersheds are definedby natural hydrology, they represent a logical basis for managing water resources. Assessments at watershed levels allow for efficientidentificationof the types of stressors that affect a watershed, as well as the controls and actions required to protect or restore the water resource.

Innovation in approaches, tools and techniques that can be used to improve and maintain the health of our nation's waters can drastically help address point and nonpoint sources of pollution, help rebuild ecosystems, restore waters, and address threats from invasive species and other impacts.

Technology Innovation Challenge and Aspiration:

Imagine a holistic, integrated watershed-based approach to water quality and water quantity management, which maximizes ecosystem restoration!

Putting It All Together: Achieving Water Sustainability

It is difficultto envision sustainable solutions to our water challenges without technological innovations, such as the distinct opportunities identifiedabove. While these water resource challenges and market opportunities are framed as individual pursuits, ideally, many of these can be achieved in an integrated manner. So, for example, in the case of a traditional municipal wastewater treatment facility, imagine a utility that generates energy; captures nutrients for resource recovery; sells their water for reuse; generates half the volume of biosolids; emits substantially less greenhouse gases; uses green and natural infrastructure to manage stormwater, mitigate climate impacts and provide aesthetic cityscape benefits;and contributes to a comprehensive watershed monitoring program in partnership with a diverse set of partners. Just imagine if we put all of the pieces together!

> "Business has a critical role to play in applying its expertise and experience in developing, implementing and scaling-up, through partnerships, watershed focused solutions."
>
> —From WBCSD's *Sharing Water: Engaging Business*, 2009.[42]

A Path Forward: Actions to Promote Technology Innovation

Our water resource and sustainability issues present significantmarket opportunities for new technology, new thinking and enhanced economic growth. EPA will be a positive contributor with utilities, industry, investors and entrepreneurs to support technology innovation for clean and safe water. Below are example actions EPA will take to support our common quest for water sustainability.

Advocate for Technology Innovation

EPA's National Water Program will be an active advocate for technology innovation.

- The National Water Program will ensure that this issue is a "front and center" topic with our regions and state partners. EPA's National Water Meeting with the regions and states will include a focus on technology innovation and ways the program can foster innovation.
- In April 2012, EPA released its *Technology Innovation for Environmental and Economic Progress: An EPA Roadmap* report (http://www2.epa.gov/envirofinance/innovation). The Roadmap sets out a vision for technology innovation and outlines support strategies for technology development and deployment. The Office of Water will be an active advocate and participant on the Agency Technology Innovation Network.
- The Office of Water will maintain a network list of key EPA innovation contacts (both at headquarters and in regional offices) for each of the market opportunity areas to foster collaboration and coordination within EPA and externally.
- The Office of Water will continue to work with the Office of Research and Development on a number of technology-innovation-related programs and initiatives. For example, the Office of Water will support implementation of the "Nitrogen and Co-pollutant Research Roadmap" to review the Agency's current nutrient research, assess gaps and prioritize future research directions to reduce nutrient pollution nationwide. The Office of Water will also support the regional water technology innovation clusters in their effortsto verify emerging technologies, research and pilot promising technologies, and provide awards to encourage innovation.

Communicate Actions and Successes

The Office of Water will showcase and celebrate examples of technology innovation aimed at highlighting or solving water resource issues through a website focused on water innovations. The Administrator, Deputy Administrator and other senior leadership within EPA will continue to showcase examples on innovation successes through site visits across the United States.

Create the Regulatory Space to Foster Technology Innovation

There are many barriers to innovation that are often cited (e.g., institutional, cultural, financial,regulatory). EPA will consider ways in which its regulatory activities can reduce barriers to, or encourage incentives for, technology innovation. Following are example actions that EPA will take, in cooperation with our EPA region and state partners:

- Update the Effluent Limitations Guidelines and Standards Program to more explicitly consider sustainable and innovative technologies when developing national standards for controlling water discharges. Stepping back and asking a broad set of questions about the best available technology might include consideration of energy use, sludge generation and disposal, process changes or green chemistry alternatives, water conservation and reuse opportunities, and byproduct and pollutant recovery prospects.
- Explore ways in which NPDES permits could be tailored to foster technology innovation within existing legal and regulatory authorities. Examples of permitting innovation might include watershed-based permitting, opportunities to foster process optimization or use of existing excess treatment capacity, derivation of long-term average limits for nutrients, opportunities

to explore alternative technologies and performance testing of those technologies, or implementation of integrated planning as outlined in the Stoner-Giles memo of June 5, 2012.[43]

- Provide technical support to overcome barriers and allow for the use of innovative technology (e.g., ways to advance "Utility of the Future" concepts). This might include considering energy, carbon sources, greenhouse gas generation, and water and biosolids reuse in a holistic, systems approach.
- Continue to foster and promote consideration and use of green and natural infrastructure to achieve a broad set of environmental, social and economic objectives.
- Participate and contribute to efforts by external parties such as the Water Environment Federation, American Water Works Association and others to explore regulatory and/or policy strategies to identify and overcome barriers to the acceptance of innovative and new technology.
- Continue to collaborate with the Department of Commerce under the Environment and Technology Working Group and Environmental Trade and Technology Advisory Committee in promoting technology-based policies internationally, as well as promoting the environmental technologies exporters' online portal (https://new.export.gov/envirotech/toolkit).

Support for Speeding Delivery of Proven Technologies

The Office of Water will examine ways to address the ongoing challenges expressed by technology developers for bringing new technologies to market. Technology providers face a complex system of state and local requirements that can discourage acceptance, adoption and use of new technologies. For example, by engaging and supporting independent third-party technology evaluation efforts, EPA aims to continue to help bridge the gap between technology development and implementation for water-related technologies. EPA's Office of Water will:

- Evaluate the opportunities to support the growing demand for technology assessment and performance demonstration/verification of a spectrum of water-related technologies (e.g., independent third party).

  Participate in development of the Water Environment Federation (WEF) and Water Environment Research Federation (WERF) Leaders Innovation Forum for Technology, (LIFT), WEF's Stormwater Testing and Evaluation for Products and Practices (STEPP) workgroup, and other promising technology evaluation efforts.

  Coordinate with other domestic and international efforts, including:

  * The Interstate Technology and Regulatory Council (ITRC), a state-led coalition working to advance the use of innovative environmental technologies and approaches.
  * The Water Research Foundation (WRF) has partnered with Isle Inc., an independent consultancy that accelerates the market uptake of emerging technologies by introducing them to potentially interested water utilities during the pre-commercial stages of development.

Innovation Highlight: WEF and WERF Lead Technology Evaluation

The Water Environment Federation and Water Environment Research Foundation have established LIFT (Leaders Innovation Forum for Technology), a program designed to enable technology evaluations for municipal and industry end-users to share the cost of conducting demonstrations to accelerate adoption of new and innovative technologies. More information can be found at http://www.werf.org/lift .

Innovation Highlight: High-Efficiency Ultraviolet Disinfection System

Several drinking water utilities, together with the Water Research Foundation, are working to pilot a high-efficiency UV system. The UV system uses a highly reflective chamber with claims of over 99 percent reflectance of 254 nm UV generated. The low-pressure UV system will be compared to the existing medium-pressure UV system at the water treatment plant. The research will evaluate the reliability and effectiveness of the technology for Cryptosporidium inactivation, maintenance requirements, and operation and maintenance costs.

Innovation Resource: Potential Funding Opportunities to Support Technology Innovation

There are a number of potential funding and other resources available to assist in the research and development of innovative solutions to water-resource-oriented issues and challenges. Examples include:

Small Business Innovation Research Program (SBIR)—SBIR encourages domestic small businesses to engage in research that has the potential for commercialization. Through a competitive awards-based program, SBIR enables small businesses to develop, and take to market, technologies that help EPA meet its mission of protecting human health and the environment."

Science to Achieve Results (STAR)—STAR is EPA's primary competitive grants program for funding extramural research in environmental science and engineering for universities and nonprofit organizations.

Small Business Technology Transfer (STTR)—STTR expands funding opportunities in the federal innovation R&D arena. Central to the program is expansion of the public/private sector partnership to include the joint venture opportunities for small businesses and nonprofit research institutions.

Clean Water State Revolving Fund (CWSRF)—Under the CWSRF, EPA provides grants or "seed money" to states to capitalize state loan fund programs that provide low-interest-rate loans with flexible terms to fund water quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management.

Strategic Environmental Research and Development Program (SERDP)—SERDP is the Department of Defense's (DOD's) environmental science and technology program, planned and executed in partnership with DOE and EPA, that issues an annual solicitation for proposals from the federal government, academia and industry.

Environmental Security Technology Certification Program (ESTCP)—ESTCP provides funding for the demonstration of environmental technologies pertinent to DOD priorities.

Conservation Innovation Grants (CIG)—CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies, awarding competitive grants to non-federal governmental or nongovernmental organizations, tribes or individuals.

Office of Energy Efficiency and Renewable Energy (EERE) Financial Assistance Programs—Through financial assistance, EERE provides funding for renewable energy and energy efficiency research and development.

Development Innovation Ventures (DIV)—DIV holds a quarterly grant competition for innovative ideas, pilots and tests them using cutting-edge analytical methods, and scales solutions that demonstrate widespread impact and cost-effectiveness.

Additional information related to funding opportunities can be found on the Office of Water Funding and Grants Web page at http://water.epa.gov/grants_funding/home.cfm .

Continue to support efforts such as the Confluence Water Technology Innovation Cluster (http://watercluster.org/wordpress/), where state regulators with Ohio, Kentucky and Indiana recently signed a groundbreaking cooperative agreement that allows the Confluence to work with companies to complete testing that can be approved by all three states at once—dramatically speeding time to market.

- The Office of Water will support EPA's ongoing efforts and programs supporting the development and implementation of innovative water-related technologies, such as the Aging Water Infrastructure Research Program (http://www.epa.gov/awi/) and STAR grants, fellowships and research contracts under the Small Business Innovative Research Program (http://www.epa.gov/ncer/).

Facilitate Financing and Funding Opportunities

EPA recognizes the critical role that funding and financing play to support the development and implementation of technology. Examples of actions EPA's Office of Water will take include:

- Continue to promote sustainable financing mechanisms such as the development of state revolving funds.
- Promote public-private partnerships for meeting infrastructure needs.
- Support innovative financing efforts for water, wastewater and stormwater, including green infrastructure. Special consideration will be made for funding of innovative projects that address virus and multiple

Innovation Highlight: EBMUD Goes Energy Positive

More than a decade ago, East Bay Municipal Utilities District (EBMUD) in California began accepting organic wastes from local food processors, food growers and livestock producers to better utilize the excess capacity in its existing anaerobic digesters. The result has been a doubling of biogas production. Along with the revenue generated from tipping fees, the increase in biogas production enabled EBMUD to fund a renewable energy system that generates more power than the facility needs. In 2012, EBMUD's wastewater treatment plant became the first in North America to be a net energy producer. More information can be found at http://www.ebmud.com/water-and-wastewater/environment/wastewater-energy.

Innovation Highlight: ReNUWIt

ReNUWIt is a multi-institution research center for re-inventing the nation's urban water infrastructure, focusing on safe, sustainable urban water infrastructures enabled by technological advances in natural and engineered systems, and informed by a deeper understanding of institutional frameworks. The research center works in close partnership with utilities, water service providers, equipment manufacturers and international research partners to convert great ideas into practical and sustainable solutions. More information can be found at http://renuwit.org/.

contaminant treatment at very small drinking water systems.

Partner and Leverage Action with Others

EPA will support of a broad spectrum of partners who have a critical role in fostering technology innovation. Here are a few examples of how EPA will support and foster the efforts of others:

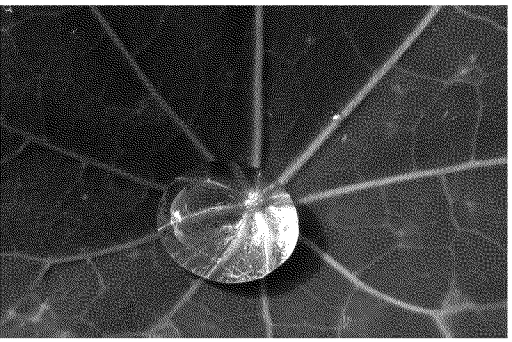
- **Partner with States and Tribes:** The EPA Office of Water will work closely with our state and tribal partners on steps to foster technology innovation, including ways to offer regulatory flexibilities for innovation and reciprocity for technology assessment and verification.
- **Partner with Other Federal Agencies:** EPA will work with other federal agencies to leverage resources to support innovative technology. For example, EPA is partnering with the Department of Energy to leverage opportunities to advance innovation in the water-energy nexus space.
- **Support Partnership Agreements and Memoranda of Understanding (MOUs) for Innovation:** The EPA has the ability to enter into partnership agreements and MOUs that foster innovation. As an example, EPA joined the Partnership on Technology Innovation and the Environment in 2012 to accelerate the development, adoption, deployment and export of technologies that protect health and the environment while growing the economy and creating jobs.[44] Also, EPA has recently established an MOU with Imagine H2O to identify and foster innovative water technologies that show promise, if implemented, in developing sustainable water supplies and watersheds.[45]
- **Support Water Technology Innovation Clusters:** EPA's Office of Research and Development has the lead for supporting and networking with other water technology clusters. EPA's National Water Program will also remain active and help communicate the efforts and accomplishments of the clusters and work in collaboration with research and the cluster leaders.
- **Assess the Science of Remote Sensors:** The EPA will work with the U.S. Geological Survey, NASA and other partners to assess the state of the science of remote sensors and remote sensing technology and the emerging watershed-based monitoring networks.
- **Promote Integrated Watershed Monitoring Networks:** The EPA Office of Water will explore partnerships with the business community, watershed groups and others to build water quality and water quantity monitoring data systems to organize information on and characterize on a watershed scale.
- **Contribute to Third Party Dialogues:** External partners have played a crucial role in convening discussions among a broad range of stakeholder groups to explore and pursue different aspects of water technology and sustainability. For example, as part of their Charting

New Waters Initiative, the Johnson Foundation at Wingspread has convened key experts on several emerging water issues. EPA will actively engage in these kinds of progressive dialogues that include balanced and diverse representation.

- **Support Export Programs and Increase Demand and Market Opportunities for U.S. Technologies and Services:** EPA with other federal agencies (e.g., Department of Commerce and the U.S. Trade Development Agency) will continue to advance economic development in partner countries by providing technical assistance and capacity building that supports legal and regulatory reform related to commercial activities and infrastructure development, establishing industry standards, and participating in other market-opening activities. These technical assistance programs facilitate favorable business and trade environments for U.S. goods and services.

Support Research, Development, and Demonstration Projects

The EPA Office of Water will continue to support research, development and deployment of technologies to support and address the water challenges articulated above. The EPA Office of Water will also support continued grants to early stage companies through its own and through Small Business Innovation Research.



A Cross Section of Views and Actions about Innovation in the Water Sphere

Since the release of the March 2013 "Blueprint,"EPA has continued to engage with a broad cross section of utility, business, investment, and academic leaders and practitioners to understand the dynamics and opportunities that restrain or foster the pursuit of technology innovation. We clearly recognize that there are direct roles and activities that EPA's National Water Program can engage in. Just as importantly, there are crucial roles that others can take, including states, utilities, the private sector, NGOs and citizens. The following is a short sampling of examples and perspectives from various sources on the technology innovation landscape that have helped to shape this document and inform the actions that EPA will take. These are just examples.

- **American Water Summit—Accelerating Change:** On November 5–6, 2013, over 300 attendees representing diverse interests including public and private utilities, financeand investors, consultants, and others partic - ipated in discussions related to driving performance, promoting the value of water, creating new financial models and incentives for investment, and recognizing water as a driver for economic growth.
- **Water Environment Federation (WEF) CEO Roundtable (2012):** On October 1, 2012, WEF convened a discussion with 16 CEOs and then Administrator Lisa Jackson and Acting Water Assistant Administrator Nancy Stoner. They identifiedfour key needs for innovation: (1) promoting public-private partnerships, (2) technology evaluation and sharing of performance data, (3) willingness among regulatory agencies and utilities to take greater risks to support pursuit of innovation, and (4) better communication and education of the public.
- **Utility of the Future:** In 2013, the National Association of Clean Water Agencies (NACWA), in collaboration with the Water Environment Research Foundation (WERF) and WEF, released *The Water Resources Utility of the Future…A Blueprint for Action.* Among other things, these organizations have fundamentally redefinedthe business case and role for the traditional "wastewater treatment utility" to one that emphasizes resource recovery (water, nutrients and energy).
- **U.S. Water Alliance:** The U.S. Water Alliance has been a key catalyst for fostering and demonstrating innovation and water sustainability through their annual "One Water Leadership Summit" and "U.S. Water Prize."Their quest for a national water vision with "one water" at its core has led to roundtables and workshops among diverse stakeholders and decision-makers, emphasizing the value of water and the urgency of integration and leadership at multiple levels
- **U.S. and World Business Council:** The World Business Council for Sustainable Development (WBCSD) has issued key papers (i.e., "Water: Facts and Trends," "Water Valuation: Building the Business Case,"and "Sharing Water: Engaging Business") that encourage businesses to engage in water valuation practices and become involved in the equation of healthy watershed management.
- **The Water Research Foundation** published *Water Quality Impacts of Extreme Weather-Related Events* in 2014. Based on actual utility case-studies, the report outlines actionable steps water utilities can take to prepare for changing weather patterns.
- **The American Water Works Association,** in its 2013 *State of the Water Industry Report,* highlights the challenges and opportunities faced by the water sector as assessed by experts at utilities, in government and among manufacturers.
- **Regional Technology Clusters:** Regional water technology innovation clusters exist in various locations across the United States (and internationally). They include interconnected firms,supporting institutions, local governments, business chambers, universities, investors and others that work together in a particular geographic area to promote economic growth and technological innovation. Clusters foster collaboration between many differentgroups and provide a variety of advantages in developing innovative technologies that build on the geographic area's strengths and interests. Several formal and emerging clusters exist. More information can be found at http://www2.epa.gov/clusters-program.

For More Information

Please visit http://www2.epa.gov/innovation/watertech for more information about technology innovation in the water sphere and for an electronic version of this document.

EPA welcomes discussion, comments and feedback. Comments can be directed to Jeff Lape, Deputy Director, Office of Science and Technology, Office of Water, U.S. EPA, MC-4301T, 1200 Pennsylvania Avenue, Washington DC 20460. Jeff's email is lape.jeff@epa.gov and his phone is (202) 566-0480.

"Innovative technology can play a significant role in solving many of the water-related problems facing the U.S. and also providing opportunities for economic development. The preponderance of evidence demonstrates that environmental protection and economic progress go hand-in-hand. President Obama said that the U.S. will win the future by out educating, out innovating, and out building competitors."

—From EPA's *Fiscal Year 2014 National Water Program Guidance,* 2013

References and Endnotes

[1] Kiparsky, M., Sedlak, D., Thompson, B.H., Truffle B. 2013. The Innovation Deficit in Urban Water: The Need for an Integrated Perspective on Institutions, Organizations and Technology. *Environmental Engineering Science*, Volume 30, Number 8.

[2] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 1. <http://www.tech-strategy.com/pdf/Winter2013.pdf> (accessed September 18, 2013).

[3] USGS. 2009. *Estimated Use of Water in the United States in 2005.* USGS Circular 1344. <http://pubs.usgs.gov/circ/1344/pdf/c1344.pdf> (accessed February 24, 2014)

[4] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 19. <http://www.tech-strategy.com/pdf/Winter2013.pdf> (accessed September 18, 2013).

[5] TechKNOWLEDGEy Strategic Group. 2013. *2013 Water Market Review: Growing Awareness, Growing Risks.* Issue 16, page 18. <http://www.tech-strategy.com/pdf/Winter2013.pdf> (accessed September 18, 2013).

[6] American Sportfishing Association. 2013. *Sportfishing in America.* <http://asafishing.org/uploads/2011_ASASportfishing_in_America_Report_January_2013.pdf> (accessed September 18, 2013)

[7] USDA Economic Research Service. 2013. Irrigation & Water Use: Background. <http://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use/background.aspx>

[8] EPA Office of Water. 2000. *Liquid Assets 2000: America's Water Resources at a Turning Point.* Page 2. <http://water.epa.gov/scitech/swguidance/standards/upload/assets_2000.pdf> (accessed September 18, 2013)

[9] EPA Office of Water. 2013. *The Importance of Water to the U.S. Economy: Synthesis Report.* Page 13. <http://water.epa.gov/action/importanceofwater/upload/Importance-of-Water-Synthesis-Report.pdf> (accessed November 21, 2013)

[10] National Drought Mitigation Center. 2014. Western U.S. Still in Grips of Drought in February 2014. <http://drought.unl.edu/NewsOutreach/MonthlySummary/February2014DroughtandImpactSummary.aspx> (accessed March 10, 2014)

[11] Comprehensive Assessment of Water Management in Agriculture. 2007. *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture.* London: Earthscan, and Colombo: International Water Management Institute. <http://www.iwmi.cgiar.org/assessment/files_new/synthesis/SummarySynthesisBook.pdf>

[12] The Economic Times. 2011. Half of World Population to Struggle for Water in 2050. <http://articles.economictimes.indiatimes.com/2011-01-17/news/28431152_1_fresh-water-ground-water-water-bodies> (accessed March 10, 2014)

[13] EPA. 2013. *The National Rivers and Streams Assessment 2008–2009: A Collaborative Survey.* EPA 841-F-13-004. <http://water.epa.gov/type/rsl/monitoring/riverssurvey/upload/NRSA200809_Fact_Sheet_Report_508_Compliant_130225.pdf>

[14] National Intelligence Council. 2013. *Global Water Security.* Intelligence Community Assessment ICA 2012-08. <http://www.dni.gov/files/documents/Special%20Report_ICA%20Global%20Water%20Security.pdf>

[15] American Society of Civil Engineers. 2013. *2013 Report Card for America's Infrastructure.* <http://www.infrastructurereportcard.org/> (accessed February 24, 2014)

[16] American Society of Civil Engineers. 2013. Drinking Water. In *2013 Report Card for America's Infrastructure.* <http://www.infrastructurereportcard.org/a/#p/drinking-water/overview> (accessed March 10, 2014)

[17] EPA. 2013. Aging Water Infrastructure. <http://www.epa.gov/sciencematters/april2010/scinews_aging-water-infastructure.htm> (accessed September 18, 2013).

[18] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* Page 2-4. <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf> (accessed September 18, 2013)

[19] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf> (accessed March 10, 2014)

[20] EPA. 2014. 2012 National Water Program Strategy. <http://water.epa.gov/scitech/climatechange/2012-National-Water-Program-Strategy.cfm> (accessed September 18, 2013)

[21] World Health Organization and UNICEF. 2013. *Progress on Sanitation and Drinking-Water: 2013 Update.* <http://apps.who.int/iris/bitstream/10665/81245/1/9789241505390_eng.pdf> (accessed September 18, 2013)

[22] National Research Council, National Academy of Sciences. 2012. *Understanding Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater.*

[23] Ernst and Young. 2013. *The US Water Sector on the Verge of Transformation: Global Cleantech Center White Paper.* <http://www.ey.com/Publication/vwLUAssets/Cleantech_Water_Whitepaper/$FILE/Cleantech-Water-Whitepaper.pdf> (accessed September 18, 2013)

[24] Electric Power Research Institute and Water Research Foundation. 2013. *Electricity Use and Management in the Municipal Water Supply and Wastewater Industries.* <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002001433 >

[25] EPA Combined Heat and Power Partnership. 2011. *Opportunities for Combined Heat and Power at Wastewater Treatment Facilities: Market Analysis and Lessons from the Field.* <http://www.epa.gov/chp/documents/wwtf_opportunities.pdf > (accessed September 18, 2013)

[26] EPA. 2014. Market Opportunities for Biogas Recovery Systems. <http://www.epa.gov/agstar/tools/market-oppt.html > (accessed September 18, 2013)

[27] EPA. 2014. National Summary of State Information. <http://ofmpub.epa.gov/waters10/attains_nation_cy.control > (accessed February 24, 2014).

[28] State-EPA Nutrient Innovations Task Group. 2009. An Urgent Call to Action: Report of the State-EPA Nutrient Innovations Task Group. <http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/2009_08_27_criteria_nutrient_nitgreport.pdf > (accessed September 18, 2013)

[29] EPA Office of Inspector General. 2009. *EPA Needs to Accelerate Adoption of Numeric Nutrient Water Quality Standards.* <http://www.epa.gov/oig/reports/2009/20090826-09-P-0223.pdf > (accessed September 18, 2013)

[30] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf > (accessed March 10, 2014)

[31] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf > (accessed September 18, 2013)

[32] Stutz, E. 2010. Israel: World Leader in Recycled Water. <http://www.israelnationalnews.com/ >

[33] EPA. 2008. *Clean Watersheds Needs Survey 2008: Report to Congress.* Appendix I, Page I-5. <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf > (accessed September 18, 2013)

[34] National Ground Water Association. 2010. Groundwater Facts. <http://www.ngwa.org/Fundamentals/use/Pages/Groundwater-facts.aspx > (accessed January 23, 2014)

[35] EPA. 2012. Water: Small Systems and Capacity Development: Basic Information. <http://water.epa.gov/type/drink/pws/smallsystems/basicinformation.cfm > (accessed September 18, 2013)

[36] EPA. 2013. *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress.* <http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf > (accessed September 18, 2013)

[37] EPA. 2011. *National Characteristics of Drinking Water Systems Serving 10,000 or Fewer People.* <http://water.epa.gov/type/drink/pws/smallsystems/upload/REVFINAL-Nat-Characte-July-2011-508-compliant.pdf > (accessed September 18, 2013)

[38] EPA Office of Inspector General. 2006. *Much Effort and Resources Needed to Help Small Drinking Water Systems Overcome Challenges.* Report No. 2006-P-00026. <http://www.epa.gov/oig/reports/2006/20060530-2006-P-00026.pdf >

[39] World Health Organization and UNICEF. 2013. *Progress on Sanitation and Drinking-Water: 2013 Update.* <http://apps.who.int/iris/bitstream/10665/81245/1/9789241505390_eng.pdf > (accessed September 18, 2013)

[40] Ibid.

[41] Water.org. 2014. Millions Lack Safe Water. <http://water.org/water-crisis/water-facts/water/ > (accessed September 18, 2013)

[42] World Business Council for Sustainable Development. 2009. *Sharing Water: Engaging Business.* <http://www.wbcsd.org/sharingwaterengagingbusiness.aspx > (accessed September 18, 2013)

[43] EPA. 2013. Integrated Municipal Stormwater and Wastewater Plans. <http://cfpub.epa.gov/npdes/integratedplans.cfm > (accessed September 18, 2013)

[44] The Partnership is a voluntary collaborative committed to accelerating the development, adoption, deployment and export of technologies that protect human health and the environment while growing the U.S. economy and creating American jobs. In addition to EPA, members of the Partnership currently include the Nicholas Institute for Environmental Policy Solutions (Duke University), the Center for Environmental Policy (American University), the Environmental Defense Fund, and others.

[45] Imagine H2O is a nonprofitorganization that supports entrepreneurship in the water sector for people to address and potentially solve water problems. Imagine conducts an annual competition that awards a business plan prize ("the Prize") to selected water entrepreneurs whose technologies show promise in addressing various water-related environmental problems.

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202-564-0264 telephone

To: Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Nandi, Romell[Nandi.Romell@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]
Cc: Loop, Travis[Loop.Travis@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Magruder, DeMara[Magruder.Demara@epa.gov]; Wilson, Elaine[Wilson.Elaine@epa.gov]; Altieri, Sonia[Altieri.Sonia@epa.gov]
From: Leonard, Darlene
Sent: Tue 3/18/2014 3:38:21 PM
Subject: FW: Final Agendas for Tomorrow's Industry Stakeholder Coffee (3/19/14)
Industry Stakeholder Coffee Agenda Mar 2014.docx
Industry Stakeholder Coffee Annotated Agenda Mar 2014.docx

Revised agendas. Same topics, just oder of one item moved to the end of the agenda. Thank you.

Darlene Leonard, Environmental Scientist

US Environmental Protection Agency

1200 Pennsylvania Avenue, NW (7404T)

Washington, DC 20460

202-566-0516

From: Leonard, Darlene
Sent: Tuesday, March 18, 2014 9:39 AM
To: Lopez-Carbo, Maria; Skane, Elizabeth; Faller, Heidi; Nandi, Romell; Stoner, Nancy; Kopocis, Ken; Gilinsky, Ellen; Lousberg, Macara
Cc: Loop, Travis; Penman, Crystal; Magruder, DeMara; Wilson, Elaine; Altieri, Sonia
Subject: Final Agendas for Tomorrow's Industry Stakeholder Coffee (3/19/14)

See attached final annotated (internal) and general agendas for Wednesday's Industry Stakeholder's Coffee at 9 am.

Darlene Leonard, Environmental Scientist

US Environmental Protection Agency

1200 Pennsylvania Avenue, NW (7404T)

Washington, DC 20460

202-566-0516

Industry Stakeholder Coffee

Wednesday, March 19, 2014

9:00am – 10:00 am

US EPA Office of Water, Room 3233 WJC East, 1201 Constitution Ave, NW, Washington, DC

Call in Number: Non-Responsive

AGENDA

1. Waters of the US **(Jim Pendergast, OWOW)**
2. Cooling Water Intake Structures **(Betsy Southerland, OST)**
3. Selenium Criteria Development **(Betsy Southerland, OST)**
4. Aluminum Criteria Revision **(Betsy Southerland, OST)**
5. Chloride Criteria **(Betsy Southerland, OST)**
6. Human Health Criteria Guidance **(Betsy Southerland, OST)**
7. Conductivity Criteria Development **(Betsy Southerland, OST)**
8. Water Quality Standards Regulatory Clarifications **(Betsy Southerland, OST)**
9. Power Plant ELGs **(Betsy Southerland, OST)**
10. Multi-Sector General Permit **(Andrew Sawyers/Deborah Nagel, OWM)**
11. National Stormwater Rulemaking **(Andrew Sawyers/Deborah Nagel, OWM)**

12. Sensitive Test Methods Rule **(Andrew Sawyers/Deborah Nagel, OWM)**

13. Buy American Interpretation/Implementation for CWSRF and DWSRF **(Andrew Sawyers, OWM and Peter Grevatt, OGWDW)**

Industry Stakeholder Coffee

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9:00am – 10:00 am

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ANNOTATED AGENDA

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   Update on interagency review/expected timeline out of OMB; timing of SAB review of connectivity report.
   Requested By: Colin Carroll, American Iron and Steel Institute; Tabby Waqar, National Association of Home Builders; and Amanda Aspatore, National Mining Association

2. Cooling Water Intake Structures **(Betsy Southerland, OST)**
   Progress on making April court deadline for issuing final rule.

   Requestor: Colin Carroll, American Iron and Steel Institute and Amanda Aspatore, National Mining Association

3. Selenium Criteria Development **(Betsy Southerland, OST)**

   Update.

   Requestor: Amanda Aspatore, National Mining Association and Jeffrey Longsworth, BT Law

4. Aluminum Criteria Revision **(Betsy Southerland, OST)**
   Potential criteria revision update.
   Requestor: Amanda Aspatore, National Mining Association

5. Chloride Criteria **(Betsy Southerland, OST)**

   Requested By: Jeffry Longsworth, BT Law

6. Human Health Criteria Guidance **(Betsy Southerland, OST)**
   Requested By: Jeffrey Longsworth, BT Law

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   Potential Criteria Development Update. Conductivity guidance.

   Requestor: Amanda Aspatore, National Mining Association and Jeffrey Longsworth, BT Law

8. Water Quality Standards Regulatory Clarifications **(Betsy Southerland, OST)**

   Timing for final rule.

   Requestor: Amanda Aspatore, National Mining Association and Jeffry Longsworth, BT Law

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   Timing update.

   Requested By: Amanda Aspatore, National Mining Association

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    Status of National Stormwater Rulemaking and EPA efforts to impose standards on newly or redeveloped properties
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    Would like to have an understanding of the role EPA's congressional office can play in "educating" Congress about the ramifications of their actions to include this language in legislation.

Requestor: Vanessa Leiby, Water & Wastewater Equipment Manufacturers

To: Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Nandi, Romell[Nandi.Romell@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]
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US Environmental Protection Agency

1200 Pennsylvania Avenue, NW (7404T)

Washington, DC 20460

202-566-0516

Industry Stakeholder Coffee

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Call in Number: Non-Responsive

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   Requestor: Amanda Aspatore, National Mining Association

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    Timing update.

    Requested By: Amanda Aspatore, National Mining Association

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    Requestor: Amanda Aspatore, National Mining Association

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    Requested By: Jeffrey Longsworth, BT Law

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Requested By: Jeffrey Longsworth, BT Law

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Evans, David[Evans.David@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Nandi, Romell[Nandi.Romell@epa.gov]; Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Nelson, Tomeka[Nelson.Tomeka@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Magruder, DeMara[Magruder.Demara@epa.gov]; Stevens, Robin[Stevens.Robin@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]
From: Evalenko, Sandy
Sent: Fri 3/14/2014 7:07:07 PM
Subject: 2-week review report
3 14 2014 OP Review Status Update and Planning.docx

Sandy Evalenko

Senior Regulatory Manager

Water Policy Staff/Office of Water

1301 Constitution Ave, NW

Washington, DC 20460

202-564-0264 telephone

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Evans, David[Evans.David@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Nandi, Romell[Nandi.Romell@epa.gov]; Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]
From: Evalenko, Sandy
Sent: Mon 3/10/2014 1:43:05 PM
Subject: 2-week review report
3 10 2014 OP Review Status Update and Planning.docx

Sandy Evalenko

Senior Regulatory Manager

Water Policy Staff/Office of Water

1301 Constitution Ave, NW

Washington, DC 20460

202-564-0264 telephone

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
From: Tarquinio, Ellen
Sent: Thur 2/27/2014 9:59:16 PM
Subject: FYI-Coalition group meeting with the Deputy Monday
3.3.14 EPA Meeting With Bob Perciasepe Agenda and Participant List.docx

Hi Nancy, Ken and Ellen-

The Deputy has a meeting Monday with the Regulatory Improvement Council and Manufacturing Action Council. They've sent the attached list of topics to discuss. Bob is comfortable on WOTUS without prep, and Rob Wood will be able to attend as well. If you'd like more info please let me know!

Thanks-

Ellen

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3313

202-566-2267

T

The Environmental Protection Agency, Deputy Administrator, Bob Perciasepe Roundtable Discussion:
The Regulatory Improvement Council (RIC) & The Manufacturing Action Council (MAC)

Date: Monday, March 3, 2014
Time: 03:00PM-04:00PM (Please arrive 20 minutes early)
Location: William Jefferson Clinton North Building (formerly the Ariel Rios North Building)
***Entrance is on 12th St. NW, a half block south of the intersection of 12th and Pennsylvania Avenue NW. ***

Proposed Agenda:

02:40: Attendees meet in the lobby of the EPA North Building (William Jefferson Clinton Building)
03:00-03:10: Wayne Valis introduce Deputy Administrator Bob Perciasepe & Self Introductions by participants
03:10-03:30: Bob Perciasepe-eye view of the current EPA activities/agenda for 2014 and beyond
03:30-03:55: Q&A/Roundtable Discussion
03:55-04:00: Wrap-up

Specific Topics of Interest:

- **National Stone, Sand and Gravel Association:**
  - Status of the Clean Water Clarification rulemaking.

  Comments: Pending at OMB, indications reveal it might be issued in the coming weeks.
- **American Cleaning Institute:**
  - Status of EPA reorganization and budget adjustments.
  - Update of EPA activities on TSCA reform.
  - EPA work on sustainability; awareness of (extensive) industry activities in the realm.
- **Fuel Cell and Hydrogen Energy Association:**
  - Allowance of fuel cells as a compliance pathway for the new carbon emission standards.
  - Allowing renewable hydrogen to qualify as an acceptable fuel under the RFS.
- **International Fragrance Association-North America:**
  - Update on EPA work plan chemicals—specifically those that have already gone through peer review.
  - Future plans for EPA work plan chemicals.
- **Edison Electric Institute:**
  - 316(b)
  - Waters of the U.S rulemaking
- **Vinyl Institute:**
  - Water main breaks not only represent a health risk but cause significant environmental and economic impact.
  - Would EPA consider setting a national goal of reducing the water main break rate?

	FIRST	LAST	TITLE	AFFILIATION
1	Jennifer	Abril	President	International Fragrance Association North America
2	Ashley	Amidon	Director, Government Affairs	National Stone, Sand and Gravel Association
3	Julie	Becker	Vice President, Environmental Affairs	Alliance of Automobile Manufacturers
4	Richard	Bozek	Director, Environmental Policy	Edison Electric Institute
5	Heidi	Brock	President	Aluminum Association
6	Bud	DeFlaviss	Director, Government Affairs	Fuel Cell and Hydrogen Association
7	Tom	Dobbins	Chief Executive Officer	American Composite Manufacturers Association
8	Donna	Harman	President & CEO	American Forest and Paper Association
9	Suzanne	Hartigan	Director, Science Policy & Technical Affairs	International Fragrance Association North America
10	Richard	Krock	Technical Director	Vinyl Institute
11	Marie	Martinko	Sr. Technical Director, Environment, Health & Safety	SPI: The Plastics Industry Trade Association
12	Daniel	Moss	Senior Manager, Government Relations	Society of Chemical Manufacturers and Affiliates
13	Keith	Pemrick	Director, Environment and Energy	American Council of Engineering Companies
14	David	Regan	VP, Government Affairs	Phillips66
15	Blair	Shipp	Manager, Communications	Valis Associates, LLC

T

The Environmental Protection Agency, Deputy Administrator, Bob Perciasepe Roundtable Discussion:
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19	Dan	Shipp	President & CEO	International Safety Equipment Association
16	Sarah	Sobeck	Director, Regulatory Affairs	Valis Associates/RIC
17	Doug	Troutman	Vice President & Counsel Government Affairs	American Cleaning Institute
18	Wayne	Valis	President & Founder	Valis Associates, LLC

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Evans, David[Evans.David@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]
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From: Nelson, Tomeka
Sent: Thur 2/27/2014 9:09:24 PM
Subject: 2-week review report
2.27.2014 OP Review Status Update and Planning (2).docx

Tomeka Nelson

OW Water Policy Staff (Detail)

202-566-1291

3226C - WJC East

To: Wood, Robert[Wood.Robert@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Garbow, Avi[Garbow.Avi@epa.gov]; Feldt, Lisa[Feldt.Lisa@epa.gov]
Cc: Levine, MaryEllen[levine.maryellen@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]; Witt, Richard[Witt.Richard@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Born, Tom[Born.Tom@epa.gov]
From: Neugeboren, Steven
Sent: Mon 2/24/2014 11:20:33 PM
Subject: RE: Report out from Today's Meeting with the Services - meeting summary attached
Meeting Between EPA and the Services on 316 022414 clean.docx
Crosswalk of DOJ framework with 316b rule and preamble (2).docx

As Rob indicated (Lisa – see below, I've added you to the emails), here is a list of issues out of the meeting. Also attached the cross walk we had shared with the Services for your reference.

Steven Neugeboren

Associate General Counsel for Water

U.S. EPA

1200 Penn Ave., NW

Washington DC 20460

202-564-5488

From: Wood, Robert
Sent: Monday, February 24, 2014 5:01 PM
To: Kopocis, Ken; Southerland, Elizabeth; Stoner, Nancy; Garbow, Avi
Cc: Neugeboren, Steven; Levine, MaryEllen; Wade, Alexis; Witt, Richard; Hewitt, Julie; Born, Tom
Subject: Report out from Today's Meeting with the Services

Steve and I met with Services, Interior and DOJ for a total of 5 hours today. We have a lot to talk with you about and need to do that soon. Steve will work through Avi's scheduler to get a meeting scheduled for tomorrow if possible or next earliest time that works. We will distribute a list of issues that separate us from Services prior to the meeting. That's it for now.

Robert K. Wood, Director

Engineering and Analysis Division

U.S. EPA Office of Water

202-566-1822

To: Stoner, Nancy[Stoner.Nancy@epa.gov]
From: Penman, Crystal
Sent: Fri 2/21/2014 2:15:28 PM
Subject: RE: 2/18 meeting with the Administrator on OW's reg. agenda

I printed new versions. Will give you the new ones when you return .l

From: Stoner, Nancy
Sent: Thursday, February 20, 2014 6:07 PM
To: Penman, Crystal
Subject: FW: 2/18 meeting with the Administrator on OW's reg. agenda

Not sure whether this is the version I have or not.

From: Lousberg, Macara
Sent: Thursday, February 20, 2014 4:54 PM
To: Stoner, Nancy; Kopocis, Ken
Cc: Gilinsky, Ellen; Shapiro, Mike
Subject: Fw: 2/18 meeting with the Administrator on OW's reg. agenda

FYI Ken and Nancy - this slightly revised version of the OW reg. matrix is what we gave OP today and put in your briefing books for tomorrow's meeting with the Administrator. Only a couple of minor changes (highlighted below) from the earlier version.

From: Lousberg, Macara
Sent: Thursday, February 20, 2014 1:46:50 PM
To: Balserak, Paul
Cc: Barron, Alex
Subject: 2/18 meeting with the Administrator on OW's reg. agenda

Hi Paul. Forwarding the revised version of OW's reg. matrix for tomorrow's meeting with the Administrator. There are just a few changes from the earlier version we sent OP, including new dates for 316(b) and WOUS (tentative). We kept the HF diesel guidance in the document but noted it as complete. We also added an entry at the end for dental amalgam, with TBD regarding specifics. FYI, Nancy Stoner is recused from this issue so it's at the end of the list in case she needs to leave the room before it's discussed.

If you have any questions, please let me know.

Macara

Macara Lousberg

Director, Water Policy Staff

Office of Water

U.S. EPA

202-564-5576

lousberg.macara@epa.gov

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]
Cc: Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]
From: Lousberg, Macara
Sent: Thur 2/20/2014 9:53:33 PM
Subject: Fw: 2/18 meeting with the Administrator on OW's reg. agenda
OW's OMB Priorities Discussion List 2 20 14 1PM.docx

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Macara

Macara Lousberg

Director, Water Policy Staff

Office of Water

U.S. EPA

202-564-5576

lousberg.macara@epa.gov

To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]
Cc: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]
From: Wood, Robert
Sent: Wed 2/19/2014 6:44:08 PM
Subject: FW: FYI, Vitter et al letter re 316(b) and ESA, incl press
document_gw_04.pdf

FYI. New letter to the Secretaries of Commerce and The Interior.

From: Skane, Elizabeth
Sent: Wednesday, February 19, 2014 1:24 PM
To: Southerland, Elizabeth; Wood, Robert; Hewitt, Julie
Cc: Zipf, Lynn; Lalley, Cara
Subject: FYI, Vitter et al letter re 316(b) and ESA, incl press

Letter from the Sens. **not** addressed to us but attached for your reference FYI, thanks to Matt K. Made E&E News, Politico (see way below) and Vitter op-en in WashTimes:

http://www.washingtontimes.com/news/2013/feb/8/endangered-species-acts-hidden-costs/

Elizabeth Skane | Special Assistant | Office of Science & Technology / Office of Water / US EPA | 202.564.5696

From: Klasen, Matthew
Sent: Wednesday, February 19, 2014 1:20 PM
To: Klasen, Matthew; Spraul, Greg
Cc: Skane, Elizabeth; Peck, Gregory
Subject: RE: POLITICO's Morning Energy, presented by Philips: Steyer looks to set stage for 2016 - Interior approves 50th public lands renewables project - Obama, Harper to talk KXL

Looks like it made Greenwire. Letter attached, and story below. (Letter isn't to us and we are not CCed, so no action for us at this point.)

mk

http://www.eenews.net/greenwire/2014/02/19/stories/1059994793

9.UTILITIES:

GOP senators want to halt ESA consultations over cooling water intake rule

Annie Snider, E&E reporter

Published: Wednesday, February 19, 2014

Four GOP senators are asking the Interior and Commerce departments to halt Endangered Species Act consultations over a long-delayed and closely watched cooling water intake rule for power plants and factories.

Sens. David Vitter of Louisiana, John Thune of South Dakota, John Boozman of Arkansas and Marco Rubio of Florida **wrote** yesterday to Interior Secretary Sally Jewell and Commerce Secretary Penny Pritzker arguing that the consultation process, which began during the late stages of the final rulemaking process, is "inappropriate" for the U.S. EPA rule. The regulation, now due out April 17, is aimed at reducing the number of aquatic organisms that get sucked into cooling water intakes and killed by being pinned against screens or being boiled in extremely hot water.

"The proposed rule is expected to create standards that would apply to existing power plants nationally," the senators wrote. "These power plants are located throughout several different regions and sub-regions of the United States, each with its own environment, site-specific conditions and requirements, and surrounding species and habitat. ... While we recognize the goals of the ESA as they apply individually to [cooling water intake structures] at existing power plants, we fail to see the value in applying provisions of the ESA beyond a project by project basis."

Industry groups have argued that the rule could force power plants, particularly nuclear generators, offline. The heads of seven nuclear companies named the ESA regulatory requirements as one of their top concerns with the proposed rule in a December letter to EPA Administrator Gina McCarthy (***Greenwire***, Feb. 11).

They argued that the new rule would have only "beneficial effects" on listed species but expressed concern that "any new ESA framework would raise considerable practical and legal problems and impose potential liabilities on the permittees."

But Reed Super, attorney for the environmental groups that sued to force EPA to create the regulation, said the law buttresses greens' interpretation of where the base line for impact on species stands.

"If they adopt a rule that essentially continues the status quo -- or even if they slightly improve on the status quo -- when they could have dramatically improved on the status quo, the ESA counts all of that impact on the endangered

species as a consequence of EPA's rule and EPA ... is contributing to the take of endangered species and putting them in jeopardy," Super said.

Matt Klasen

U.S. Environmental Protection Agency

Office of Water (IO)

(202) 566-0780

cell (202) 505-0787

From: Klasen, Matthew
Sent: Wednesday, February 19, 2014 10:40 AM
To: Spraul, Greg
Cc: Skane, Elizabeth; Peck, Gregory
Subject: FW: POLITICO's Morning Energy, presented by Philips: Steyer looks to set stage for 2016 - Interior approves 50th public lands renewables project - Obama, Harper to talk KXL

Hey Greg S.:

Any chance you've seen this letter (either through your channels or thru Politico Pro, if we get it)?

Thanks,
Matt

REPUBLICANS WANT JEWELL, PRITZKER TO BACK OUT OF 316(b) RULEMAKING: Four GOP senators want Interior Secretary Sally Jewell and Commerce Secretary Penny Pritzker to pull their agencies out of endangered species review of EPA's long-delayed proposed "316(b)" rulemaking governing cooling towers at existing power plants. The

Fish and Wildlife Service and NOAA began a "Section 7 consultation" with EPA over the rule last summer, and EPA recently agreed to finish the rule by April 17. But Sens. Marco Rubio, John Thune, David Vitter and John Boozman want the agency to "vacate the consultation process" because they "believe that it is an inappropriate application of the" Endangered Species Act, they said in a letter sent yesterday: http://politico.pro/O6Jpcu

---

Matt Klasen

U.S. Environmental Protection Agency

Office of Water (IO)

(202) 566-0780

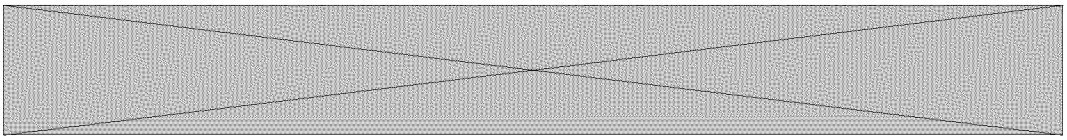
cell (202) 505-0787

=====

To: Garbow, Avi[Garbow.Avi@epa.gov]; Mallory, Brenda[Mallory.Brenda@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Wood, Robert[Wood.Robert@epa.gov]; Hewitt, Julie[Hewitt.Julie@epa.gov]; Shriner, Paul[Shriner.Paul@epa.gov]; Balserak, Paul[Balserak.Paul@epa.gov]; Beauvais, Joel[Beauvais.Joel@epa.gov]; Neugeboren, Steven[Neugeboren.Steven@epa.gov]; Levine, MaryEllen[levine.maryellen@epa.gov]; Wade, Alexis[Wade.Alexis@epa.gov]
From: Witt, Richard
Sent: Wed 2/19/2014 6:33:44 PM
Subject: Judge's conference on 316(b) April 22

You will recall that, as part of the agreement to extend the deadline to April 17 for final action on 316(b), we agreed not to oppose a Riverkeeper request for a conference. Judge Swain who would preside in any reopened 316(b) deadline litigation has now scheduled it.

To: Stoner, Nancy[Stoner.Nancy@epa.gov]
From: E&E Publishing
Sent: Wed 2/19/2014 6:18:19 PM
Subject: February 19 -- Greenwire is ready



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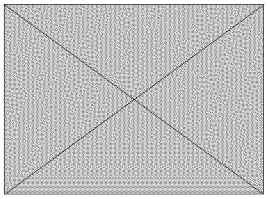

Greenwire -- Wed., February 19, 2014 -- Read the full edition

1. DROUGHT: Reclamation to slash water deliveries for Calif. farmers to historic low

The Obama administration plans a historic tightening of the spigot for California farmers in the face of punishing drought. The Bureau of Reclamation notified senior water contractors on the Sacramento and San Joaquin rivers last weekend that they should expect 40 percent of their regular deliveries this year.

Top Stories

2. KEYSTONE XL: Moniz, McCarthy hint at split opinions on pipeline approval

3. SOLAR: Interior OKs 2 'milestone' utility-scale projects on public lands

4. WHITE HOUSE: OIRA chief's buttoned-down image belies eccentric roots

Politics

5. ELECTRICITY: Moniz touts plans for building 'grid of the future'

6. CLIMATE: Kerry's remarks on warming still drawing fire from

conservatives

7. PEOPLE: State enviro council names new executive director

8. PEOPLE: Former DOT secretary joins board of electric bus maker

Congress

9. UTILITIES: GOP senators want to halt ESA consultations over cooling water intake rule

10. ENERGY EFFICIENCY: Senators aim to boost motor efficiency, slash energy use

Natural Resources

11. FOREST SERVICE: Agency requests budget cut, then restricts law enforcement -- watchdog group

12. ENDANGERED SPECIES: FWS too 'self-congratulatory' over Modoc sucker delisting -- conservative group

13. SALMON: DOE lab designs tiny battery to better track endangered fish

14. PUBLIC LANDS: Liberal group wants parks to reflect nation's diversity

15. WEATHER: Century-old maritime law leads to N.J. road salt shortage

16. FORESTS: Kellogg switches to sustainable palm oil

17. WILDLIFE: Calif. city targets squirrels living in landfill park

Law

18. NUCLEAR: Nun sentenced to almost 3 years in prison for Tenn. break-in

Energy

Federal Agencies

Air and Water

Wastes & Hazardous Substances

States

ineffective

International

33. FRANCE: Activists dump coal in front of president's palace

34. SPAIN: Rice farmers struggle to fight off invasive snail

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To send a press release, fax 202-737-5299 or e-mail editorial@eenews.net.

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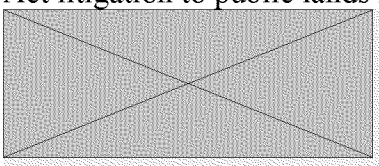

To: Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]
From: Kopocis, Ken
Sent: Wed 2/19/2014 1:50:39 PM
Subject: RE: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

I am available to attend.

From: Tarquinio, Ellen
Sent: Wednesday, February 19, 2014 8:29 AM
To: Kopocis, Ken; Southerland, Elizabeth; Stoner, Nancy
Subject: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

Hi Ken, Nancy and Betsy-

There is a meeting scheduled for tomorrow at 1pm with the Administrator and Exelon CEO. They've just sent over topics they'd like to discuss, and 316(b) is on the list. (What they've submitted : discuss EPA's upcoming GHG NSPS regulations for power plants and 316(b) cooling water intake structure rule.) **Is there anyone who would be able to attend to discuss 316 (b)? Just let me know-**

Thanks-

Ellen

01:00 PM - 01:30 PM Meeting with Exelon CEO Chris Crane - Administrator's Office

SCt: Alison Kukla

Ct: Amy Trojecki, amy.trojecki@exeloncorp.com

Staff:

TBD

Attendees:

Joe Dominguez, Senior Vice President, Governmental and Regulatory Affairs and Public Policy

Kathleen Barron, Senior Vice President, Federal Regulatory Affairs and Wholesale Market Policy

Amy Trojecki, Director, Environmental and Fuels Policy

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3313

202-566-2267

To: Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]
From: Tarquinio, Ellen
Sent: Wed 2/19/2014 1:49:58 PM
Subject: RE: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

Thanks Elizabeth. No materials needed. Avi has just responded that he will attend as well.

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3313

202-566-2267

From: Skane, Elizabeth **On Behalf Of** Southerland, Elizabeth
Sent: Wednesday, February 19, 2014 8:44 AM
To: Tarquinio, Ellen; Kopocis, Ken; Southerland, Elizabeth; Stoner, Nancy
Subject: RE: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

FYI Betsy is still out of the office. I can reach out to Rob Wood if you want, Ken/Nancy. Or you can, just let me know your preference.

Ellen do you need any materials?

Elizabeth for Betsy.

Elizabeth Skane | Special Assistant | Office of Science & Technology / Office of Water / US EPA | 202.564.5696

From: Tarquinio, Ellen
Sent: Wednesday, February 19, 2014 8:29 AM
To: Kopocis, Ken; Southerland, Elizabeth; Stoner, Nancy
Subject: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

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Staff:

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Amy Trojecki, Director, Environmental and Fuels Policy

Ellen Tarquinio

Special Assistant

Office of the Administrator

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To: Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]
From: Skane, Elizabeth
Sent: Wed 2/19/2014 1:43:57 PM
Subject: RE: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

FYI Betsy is still out of the office. I can reach out to Rob Wood if you want, Ken/Nancy. Or you can, just let me know your preference.

Ellen do you need any materials?

Elizabeth for Betsy.

Elizabeth Skane | Special Assistant | Office of Science & Technology / Office of Water / US EPA | 202.564.5696

From: Tarquinio, Ellen
Sent: Wednesday, February 19, 2014 8:29 AM
To: Kopocis, Ken; Southerland, Elizabeth; Stoner, Nancy
Subject: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

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Ellen

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SCt: Alison Kukla

Ct: Amy Trojecki, amy.trojecki@exeloncorp.com

Staff:

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Attendees:

Joe Dominguez, Senior Vice President, Governmental and Regulatory Affairs and Public Policy

Kathleen Barron, Senior Vice President, Federal Regulatory Affairs and Wholesale Market Policy

Amy Trojecki, Director, Environmental and Fuels Policy

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3313

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To: Kopocis, Ken[Kopocis.Ken@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]
From: Tarquinio, Ellen
Sent: Wed 2/19/2014 1:28:42 PM
Subject: 316 (b) discussion at Exelon meeting tomorrow with the Administrator

Hi Ken, Nancy and Betsy-

There is a meeting scheduled for tomorrow at 1pm with the Administrator and Exelon CEO. They've just sent over topics they'd like to discuss, and 316(b) is on the list. (What they've submitted : discuss EPA's upcoming GHG NSPS regulations for power plants and 316(b) cooling water intake structure rule.) **Is there anyone who would be able to attend to discuss 316 (b)? Just let me know-**

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Ct: Amy Trojecki, amy.trojecki@exeloncorp.com

Staff:

TBD

Attendees:

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Kathleen Barron, Senior Vice President, Federal Regulatory Affairs and Wholesale Market Policy

Amy Trojecki, Director, Environmental and Fuels Policy

Ellen Tarquinio

Special Assistant

Office of the Administrator

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To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Evans, David[Evans.David@epa.gov]; Clark, Becki[Clark.Becki@epa.gov]
Cc: Telleen, Katherine[Telleen.Katherine@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Zipf, Lynn[Zipf.Lynn@epa.gov]; Faller, Heidi[Faller.Heidi@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Evalenko, Sandy[Evalenko.Sandy@epa.gov]; Skane, Elizabeth[Skane.Elizabeth@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Loop, Travis[Loop.Travis@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Lopez-Carbo, Maria[Lopez-Carbo.Maria@epa.gov]; Sanelli, Diane[Sanelli.Diane@epa.gov]; Peterson, Jeff[Peterson.Jeff@epa.gov]; Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Nelson, Tomeka[Nelson.Tomeka@epa.gov]; Nandi, Romell[Nandi.Romell@epa.gov]; Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]
From: Nelson, Tomeka
Sent: Tue 2/18/2014 4:54:42 PM
Subject: 2-week review report
2.18.2014 OP Review Status Update and Planning (2).docx

Tomeka Nelson

OW Water Policy Staff (Detail)

202-566-1291

3226C - WJC East

To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Penman, Crystal[Penman.Crystal@epa.gov]; Magruder, DeMara[Magruder.Demara@epa.gov]
From: Tarquinio, Ellen
Sent: Fri 2/14/2014 8:11:10 PM
Subject: FW: Materials for Reg Agenda Discussion with OW - 2/18
OW's OMB Priorities Discussion List 1 29 14 final.docx
OW Priority Rule Overview fnl.doc
OW Priority Rule Cover Memo fnl.doc

Materials just came in for the Reg. Agenda meeting with the Administrator and OP.

Thanks!

Ellen

Ellen Tarquinio

Special Assistant

Office of the Administrator

WJC North 3313

202-566-2267

To: Administrator B6 Deputy Administrator[62Perciasepe.Bob73@epa.gov]; Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Feldt, Lisa[Feldt.Lisa@epa.gov]; Ganesan, Arvin[Ganesan.Arvin@epa.gov]
Cc: Beauvais, Joel[Beauvais.Joel@epa.gov]; Kime, Robin[Kime.Robin@epa.gov]
From: Barron, Alex
Sent: Fri 2/14/2014 7:45:23 PM
Subject: Materials for Reg Agenda Dicussion with OW -2/18
OW's OMB Priorities Discussion List 1 29 14 final.docx
OW Priority Rule Overview fnl.doc
OW Priority Rule Cover Memo fnl.doc

Administrator, Bob, Nancy, Ken, Lisa and Arvin – These materials are coming through the formal channels but, as a preview, please find attached materials for the upcoming regulatory agenda discussion with OW. The three materials are:

A template completed by OW of upcoming signature actions

A summary/grouping of those actions assembled by OP

A cover memo that highlights a few actions which we may want to focus on; However, we want this to be an open discussion and others are welcome to highlight other actions that they think warrant conversation.

Alex

Alex Barron, Ph.D.

Senior Advisor

Office of Policy

U.S. Environmental Protection Agency

202-564-3304

To: Grevatt, Peter[Grevatt.Peter@epa.gov]; Clark, Amy[Clark.Amy@epa.gov]; Southerland, Elizabeth[Southerland.Elizabeth@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Frace, Sheila[Frace.Sheila@epa.gov]; Best-Wong, Benita[Best-Wong.Benita@epa.gov]; Evans, David[Evans.David@epa.gov]
Cc: Stoner, Nancy[Stoner.Nancy@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Ruf, Christine[Ruf.Christine@epa.gov]; Nelson, Tomeka[Nelson.Tomeka@epa.gov]; Flaharty, Stephanie[Flaharty.Stephanie@epa.gov]; Telleen, Katherine[Telleen.Katherine@epa.gov]; Krieger, Andrew[Krieger.Andrew@epa.gov]; Tarquinio, Ellen[Tarquinio.Ellen@epa.gov]
From: Evalenko, Sandy
Sent: Fri 2/14/2014 4:42:43 PM
Subject: Summary Spring 2014 Regulatory Agenda
2 12 2014 Spring FY14 Reg Agenda Chart Final draft.docx

Attached is the Spring 2014 Regulatory Agenda summary Chart. The Spring 2014 Regulatory Agenda chart lists OW actions in chronological order and identifies and the substantive changes in red new actions. The 5 sections of the Semi-Annual regulatory Agenda are pre-rule (ANPRM), proposed rules, final rules, long term and completed. Long term actions have publication dates beyond April, 2015. We have a few actions with tentative dates and expect that we'll have input from the Administrator after Nancy Stoner's meeting on Tuesday. Please let me or Tomeka Nelson know if you have questions about the chart which summarizes information provided by the Senior Regulatory Managers.

Sandy

Sandy Evalenko

Senior Regulatory Manager

Water Policy Staff

3226K WJC East

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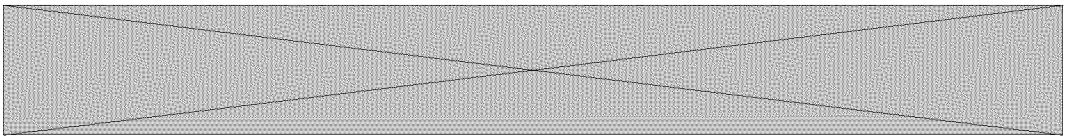
Washington, DC 20460

202-564-0264

To: Stoner, Nancy[Stoner.Nancy@epa.gov]
From: E&E Publishing
Sent: Tue 2/11/2014 6:13:34 PM
Subject: February 11 -- Greenwire is ready



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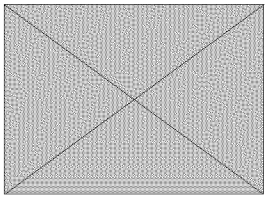

Greenwire -- Tue., February 11, 2014 -- Read the full edition

1. WETLANDS: Marcellus drillers feel heat as EPA mulls expanded Clean Water Act oversight

JANE LEW, W.Va. -- Wetlands were early casualties of the Marcellus Shale boom. Beginning in 2007, oil and gas drillers in West Virginia built well pads, roads, compressor stations and pipelines through streams and wetlands at nearly 50 sites without Clean Water Act permits, according to a *Greenwire* review of U.S. EPA compliance orders for drilling in the state. As the drilling spread, concerns about potential wetland violations were eclipsed by questions from regulators and the public about the drilling technique -- hydraulic fracturing, or fracking -- and its possible impact on drinking water quality and public health.

Top Stories

2. ELECTRICITY: FERC lifts price cap for grid operators in Midwest, Mid-Atlantic

3. KEYSTONE XL: TransCanada threatens to change pipeline route to avoid permit delays

4. FERC: Nominee's lack of policy experience seen as asset after Binz collapse

Congress

5. DEBT CEILING: House GOP gives up demands, plans clean vote tonight

6. POLITICS: LCV report card laments falling bipartisan commitment to environment

Politics

7. UTILITIES: Enviros set new deadline for cooling water rule as nuclear industry stresses climate implications

8. GRID: Bipartisan senators cite polar vortex as dire warning about reliability

Natural Resources

9. FISHERIES: L.A. chefs plead guilty to serving whale meat

10. INVASIVE SPECIES: Boondoggles add to price tag of Army Corps carp plan -- critics

11. WILDLIFE: Yellowstone officials plan to slaughter hundreds of bison

12. INVASIVE SPECIES: Frigid blast in Mont., Wyo. unlikely to dislodge mountain pine beetle

13. ENDANGERED SPECIES: Threatened listing brings mixed outcome for populations

14. PEOPLE: Jane Goodall continues to campaign for animal rights

15. WILDLIFE: Animal trainers face uncertain future in Hollywood

Law

16. CLIMATE: Clean Air Act justifies EPA actions to address warming, agency says in Supreme Court filing

17. AIR POLLUTION: EPA appeals ruling that tossed 'certificates of conformity' for engine maker

Energy

Business

Air and Water

Wastes & Hazardous Substances

International

31. CHINA: Environmental watchdog cracks down on polluters

32. SOUTH AFRICA: Waste from abandoned gold mines taints Johannesburg

E&ETV's OnPoint

33. RENEWABLES: Solar Foundation's Luecke discusses impact of net-metering debate on job growth

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To send a press release, fax 202-737-5299 or e-mail editorial@eenews.net.

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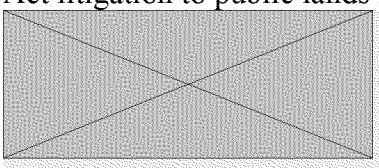
Greenwire is written and produced by the staff of E&E Publishing, LLC. The one-stop source for those who need to stay on top of all of today's major energy and environmental action with an average of more than 20 stories a day, Greenwire covers the complete spectrum, from electricity industry restructuring to Clean Air Act litigation to public lands management. Greenwire publishes daily at 1 p.m.



To: Stoner, Nancy[Stoner.Nancy@epa.gov]; Lape, Jeff[lape.jeff@epa.gov]; Grevatt, Peter[Grevatt.Peter@epa.gov]; Sawyers, Andrew[Sawyers.Andrew@epa.gov]; Kopocis, Ken[Kopocis.Ken@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]; Rose, Bob[Rose.Bob@epa.gov]; Shapiro, Mike[Shapiro.Mike@epa.gov]; Gorke, Roger[Gorke.Roger@epa.gov]
Cc: Loop, Travis[Loop.Travis@epa.gov]; Blette, Veronica[Blette.Veronica@epa.gov]; Gitlin, Bonnie[Gitlin.Bonnie@epa.gov]; Horne, James[Horne.James@epa.gov]; Stabenfeldt, Lynn[Stabenfeldt.Lynn@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]; Tricas, Marisa[Tricas.Marisa@epa.gov]
From: Hoffer, Ron
Sent: Mon 2/10/2014 3:49:06 PM
Subject: FYI -- Water/Energy data for Administrator TPs (San Antonio - this Wednesday)
EPRI Elec Use and Mgt in Muni W and WW Sectors-2013-Exec Summary.docx
EPRI-Electricity Use and Management in the Municipal Water and Wastewater Sector-2013.pdf

FYI since most of you have been on an e-mail discussion on one or more bits of this.

I will send you any updated aggregate information to prevent overloading your in box.

Ron

From: Hoffer, Ron
Sent: Monday, February 10, 2014 10:39 AM
To: Samy, Kevin; Loop, Travis
Cc: Gitlin, Bonnie; Horne, James; Blette, Veronica; Stabenfeldt, Lynn; Lousberg, Macara
Subject: TIME SENSITIVE: Water/Energy data for Administrator TPs (San Antonio - this Wednesday)

Kevin and Travis:

Your request came to me on Saturday; glad several key folks were here in the office today. It was also helpful to catch up this morning with Kevin to clarify the context. After checking with my colleagues, the most reputable data is from a very recent (November 2013) report of the Electric Power Research Institute (EPRI) *" Electricity Use and Management in the Municipal Water Supply and Wastewater Industries"* The report and highlighted Executive Summary is attached. That report estimates that the water and wastewater utility sector uses approximately 1.8% of the U.S. energy supply, broken down as follows:

· U.S. public drinking water systems use roughly 39.2 billion kWh per year, which corresponds to about 1% of total electricity use in the U.S.. This includes pumping water (by far the largest component) and drinking water treatment costs.

· Municipal wastewater treatment systems in the U.S. use approximately 30.2 billion kWh per year, or about 0.8% of total electricity use in the U.S. From separate analyses, EPA believes that over half of the energy used in wastewater treatment is for one process – wastewater aeration.

The actual total of energy used by the sector on an absolute basis has increased over the last 20 years (the baseline for the previous reputable analysis); even though proportion has been estimated to drop from 3% of U.S. energy totals to the 1.8% cited above. EPRI (2013) notes that:

· *" For public drinking water systems, the current estimate represents a 39% increase relative to the value given in the 1996 report, likely due principally to population growth and a small but significant increase in desalination. For the municipal wastewater industry, the current estimate corresponds to a 74% increase over the previously reported value, likely due to both population growth and the more widespread implementation of secondary treatment by U.S. wastewater treatment facilities."*

Energy use does vary by location, facility, geography, and accounting method. Research carried out by California's Energy Commission some 10 years ago, suggests that California's utility sector use is approximately double the National average, with 3% going to water supply and treatment in homes, commerce and industry, and 1% going for wastewater treatment. By way of comparison, approximately 11% of California's total energy consumption goes to non-agricultural end user needs – largely water heating in homes, commercial buildings and industry.

While the sector may seem small in terms of overall energy use, these represent large cost figures for cities and towns. It is not uncommon for 30 to 40% of a municipality's energy bill is associated with water and wastewater utility operations. There are numerous potential energy savings from the deployment of new technologies and management strategies which many localities are deploying. Examples cited by the Congressional Research Service earlier this year includes:

· DC Water -- hoping to save $10 million per year in energy savings from wastewater-generated biogas

· Gloversville-Johnson NY Joint Wastewater Treatment Facility which – through energy recovery from dairy whey -- reduces energy costs by $500,000 per year and generates revenue of $750,000 per year, to the

· Calera Creek Water Recyling Plant in Pacifica< California, whose solar panels supply 10-15% of plant energy needs, saving $100,00 annually

Given your short timeframe, I am copying a few of my colleagues who are quite central to these topics. Jim and Bonnie with respect to the utility sector, and Veronica with our WaterSense program.

Hope this helps.

One point; the CRS report I cite above has actually outdated overall US figures since their study was completed right before the critical EPRI study I note above.

Hope this gets you started but let us know if you need more clarification

Ron

Ron Hoffer

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From: Samy, Kevin

Sent: Friday, February 07, 2014 4:07 PM

To: Loop, Travis

Subject: water treatment cost data

Hey Travis,

I just spoke to the Admin on upcoming speeches…she mentioned that there existed some great date on the energy intensity of water treatment (and related stats). She mentioned that R1 did a lot of work on this…

I was hoping this rang a bell/you'd have a lead on where to go to secure that info?

If there's a particular person/office you handles – feel free to just direct me, happy to follow up with them specifically.

Thanks for your help, as always.

Kevin Samy

Speechwriter | Environmental Protection Agency

(o) 202.564.4653 | (m) 202.909.6412

Electricity Use and Management in the Municipal Water Supply and Wastewater Industries

3002001433
Final Report, November 2013

Electric Power Research Institute
S. Pabi
A. Amarnath
R. Goldstein

Water Research Foundation
L. Reekie

EXECUTIVE SUMMARY

Clean drinking water and effective wastewater treatment are vital services needed in all communities. These safeguards protect the public health, strengthen the community infrastructure, and provide a foundation for economic growth. Yet increasing concerns about the adequacy of existing services are posing serious challenges to local communities. These concerns are felt not just in the U.S., but internationally as well. The relationship between water and energy and opportunities for better managing energy use continues to be an area of great interest for electric utilities and water and wastewater treatment facilities.

The use of electricity for water and wastewater treatment is increasing due to demands for expanded service capacity and new regulations for upgraded treatment. Options available to control the electricity costs include technological changes, improved management, and participation in electric utility sponsored energy management programs. Appropriate options for a specific system will vary depending on the system characteristics, availability of electric utility programs to assist the water and wastewater utilities, and adequate funding and management skills to implement changes.

Background

In 1996, EPRI's Community Environmental Center at Washington University in St. Louis, MO published a report entitled *Water and Wastewater Industries: Characteristics and Energy Management Opportunities*.[1] The report describes how electricity is used and can be managed efficiently in water and wastewater treatment.

[1] *Water and Wastewater Industries: Characteristics and Energy Management Opportunities*. EPRI, Palo Alto, CA: September 1996. CR-106941.

At the time the 1996 report was developed, the electric power industry and the water and wastewater industries recognized that the inextricable link between energy and

water was only getting stronger due to significant changes such as:

- Increasing demand for water and wastewater services
- Promulgation of more stringent environmental regulations
- Concerns about funding for upgrading aging facilities
- Growing operating costs

To address the impacts of the changing water and wastewater industries, EPRI engaged a team of experts to identify opportunities for energy management so both electric utilities and their water and wastewater customers could work together to define and implement appropriate programs.

Thus, the 1996 report was designed to provide electric utility planning and marketing staff as opportunities, practices, and technologies. Further, clarification on proper use of this data needs to be addressed so that planners and engineers can use it with a proper contextual understanding.

Objectives

The primary objective of this study is to update the previous report to describe the current industry. Though much of the information in the 1996 EPRI report is still relevant, the electric utility industry and the water and wastewater industry have changed over the past 15 years.

Environmental regulations have continued to become more rigorous, operating costs including labor and energy have increased, technology has advanced, and there are now greater opportunities for managing energy use. Similar to its predecessor, this report is designed to provide electric utility planning and marketing staff and water and wastewater treatment plant management with a practical tool to:

- Understand the water and wastewater industries and the challenges they face
- Understand the various operations and processes used in water and wastewater treatment and how electric energy is used in different plant configurations
- Identify and characterize opportunities for improving energy efficiency and load management, promoting demand response, recovering and generating energy, and encouraging electrotechnologies that will benefit both the water and wastewater treatment facilities and the electric utilities
- Help develop energy management plans to realize such opportunities

An additional study objective is to identify water and wastewater research, development and demonstration (RD&D) projects for joint sponsorship by both the water and wastewater industry and electric utility representatives. Given the significant electricity requirements of the water and wastewater industry, the commonalties between electric utilities and water and wastewater utilities, and the importance of solid infrastructure to economic growth, it makes good business sense for electric utilities and EPRI to participate in water and wastewater RD&D activities.

Scope

This report describes how electricity is currently used and how it can be managed more efficiently in the public water supply and municipal wastewater treatment industries. The intention is to provide energy use characteristics that represent what is actually

occurring at water and wastewater treatment plants across the country, based on the study team's field experience and a comprehensive review of the literature. Therefore, the energy use data reflect electric use values as encountered in operating plants today, rather than the most efficient operation possible. Water and wastewater treatment plants typically operate at some fraction of design capacity nearly all the time, meaning that operating inefficiencies are built into the facility. The report provides daily energy use values for common water and wastewater unit processes and describes approaches for summing up pertinent unit process values to develop an"expected" total daily energy use for a facility, recognizing that the range of possible electric use values for treatment facilities is quite broad.

Complementary Work

The Water Environment Research Foundation (WERF) has been carrying out another study in parallel with the EPRI study. The WERF study is developing energy use data for a wide range of wastewater treatment facilities, with a focus on developing energy benchmarks.[2] The benchmarks provide facilities with targets for energy use, depending on a plant's size and unit processes. The WERF study provides more detail for wastewater treatment facilities, but does not include drinking water facilities. While the WERF study is developing energy benchmarks based on engineering design calculations and Best Practices, the EPRI study provides energy intensity values for various unit processes based on calculations of what is typically seen in water and wastewater treatment facilities. The EPRI study and the WERF study complement each other through their different approaches. Both studies stand to increase the understanding of the water-energy nexus and opportunities to maximize energy efficiency and energy management.

[2] As of October 31, 2013, the WERF study had yet to be published. The WERF project is titled "Energy Balance and
Reduction Opportunities, Case Studies of Energy-Neutral Wastewater Facilities and Triple Bottom Line (TBL)
Research Planning Support" (WERF project number ENER1C12). The principal investigators are Steve Tarallo,
P.E., and Paul Kohl, P.E.

Approach

To achieve study objectives, the team assembled information from the literature, government entities, private research groups, and other sources to characterize the water and wastewater industries in terms of number and type of facilities, processes use, electricity use and usage patterns, and changes that are occurring in regulations and technology. From this information, the team segmented each industry based upon parameters such as size, function, and key process elements to assess the relative magnitude of energy management opportunities. New processes and operations that were not included in the 1996 report, but which are now considered significant, were added to the analysis. The team used a bottom up approach based on available data to update the energy intensity (EI) values (in kWh/million gallons) for the various unit processes. The values were refined using best engineering judgment and by cross-checking with actual water and wastewater treatment plant data. The team identified those treatment unit processes offering the best opportunities for energy management

measures and analyzed them in detail to identify electrotechnologies and other alternatives to better meet process objectives.
Representative facilities were included as case studies, exemplifying the application of various energy management and technological solutions. Finally, the team reviewed and presented emerging and innovative technologies that promise greater energy management and improved treatment and, thus, represent good candidates for demonstration projects.

Findings

Electricity Use in Public Water Supply and Treatment

The vast majority of the U.S. public water supply consists of community water systems. There are over 51,000 community water systems in the U.S., with most systems being relatively small. Ninety two percent of the community water systems provide drinking water to communities serving 10,000 people or less, while 8% of community water systems provide water to about 82% of the population. The two primary sources of water for public drinking water systems are groundwater and surface water. Groundwater systems exist in the greatest quantity, but they tend to be smaller than surface water systems and they serve a smaller share of the population.
Surface water systems require more water treatment than groundwater systems and are thus more energy intensive. A small percentage of water is supplied from the desalination of sea water and brackish water (less than 4%), but this is a growing segment. Desalination is the most energy intensive type of water treatment. For all drinking water plants much of the energy is used for pumping.

The team developed estimates of energy intensity for raw water pumping and all unit processes associated with drinking water treatment as a function of average flow rate. The flow rates investigated are 1, 5, 10, 20, 50, 100, and 250 million gallons per day (MGD). The report provides comprehensive tables containing these values, which can be used to estimate composite energy use for hypothetical plants made up of different combinations of unit processes.

The project team used these data to develop electric energy intensity values for three types of systems: surface water, groundwater, and desalination. Then, the team mapped the resulting energy intensities to detailed inventory data for existing public water systems from the U.S. Environmental Protection Agency (EPA) and U.S. Geological Survey to approximate total electricity use by U.S public drinking water industry. Using this method, U.S. public drinking water systems use roughly 39.2 billion kWh per year, which corresponds to about 1% of total electricity use in the U.S.

Electricity Use in Municipal Wastewater Treatment

The municipal wastewater treatment industry is composed of nearly 15,000 publicly owned treatment works (POTWs) that handle a total flow of over 32,000 MGD and serve about 74% of the U.S. population. The remaining population is served by septic and other on-site systems.
Larger plants treat the majority of the wastewater flow; most U.S. plants provide

secondary or greater treatment. In contrast to drinking water systems where pumping accounts for most energy use, wastewater treatment is more closely related to treatment needs. Advanced wastewater treatment usually includes aeration for removing dissolved organic matter and nutrients; thus, aeration is the principal energy-using process in wastewater treatment.

Using the same approach as for drinking water systems, the team developed estimates of energy intensity for typical unit processes associated with wastewater treatment as a function of average flow rates ranging from 1 to 250 MGD. Unit processes investigated include wastewater pumping, primary treatment, secondary treatment, solids handling, treatment and disposal, filtration and disinfection, utility water, and potential energy recovery (from anaerobic digestion of solids). Several treatment options have been added since the 1996 report reflecting their widespread implementation or acceptance within the industry, including odor control, sequencing batch reactors, membrane bioreactors, UV disinfection, and various filtration methods. The resulting tables of values can be used to estimate composite energy use for hypothetical wastewater treatment plants containing different configurations of unit processes.

The team estimated electricity use for the U.S. wastewater treatment industry following the procedure in the 1996 EPRI report. The approach uses EPA's Clean Watershed Needs Survey plant flow data based on level of treatment along with the energy intensity values developed by the project team and a review of prior estimates from other organizations. The result is that municipal wastewater treatment systems in the U.S. use approximately 30.2 billion kWh per year, or about 0.8% of total electricity use in the U.S.

Comparison with 1996 Report

The use of electricity for water and wastewater treatment in the U.S. has grown during the last 20 years and will continue to grow. Table ES-1 compares the annual electricity use values developed in this study with those reported in the 1996 EPRI study. For public drinking water systems, the current estimate represents a 39% increase relative to the value given in the 1996 report, likely due principally to population growth and a small but significant increase in desalination. For the municipal wastewater industry, the current estimate corresponds to a 74% increase over the previously reported value, likely due to both population growth and the more widespread implementation of secondary treatment by U.S. wastewater treatment facilities. It is worth noting that there have been some inroads made from more energy efficient practices by water and wastewater treatment agencies that have probably decreased the magnitude of the potential increase, but substantial progress is still possible in this area.

Table ES-1
Comparison of Annual Electricity Use Between 1996 Report and Now

	Annual Electricity Use (billion kWh/yr)		
	1996 Report	Current Stud	Percent Increase

Public Water Supply and Treatment	28.3	39.2	39%
Municipal Wastewater Treatment	17.4	30.2	74%

Energy Management Opportunities

This report categorizes the opportunities for improving energy management in the water and wastewater industries into three main groups, which are summarized in Table ES-2. Opportunities that involve electrotechnologies are in bold font type.

Table ES-2
Energy Management Opportunities Presented in the Study

Energy Efficiency and Demand Response	Emerging Technologies and Processes	Energy Recovery and Generation
• Strategic Energy Management • Data Monitoring and Process Control • Water Conservation • **High-Efficiency Pumps and Motors** • **Adjustable Speed Drives** • Pipeline Optimization • **Advanced Aeration** • Demand Response	• **Odor Control** • **Membrane Bioreactors** • Deammonification Sidestream Process • Water Reuse • **Residuals Processing** • Microbial Fuel Cells • **LED UV Lamps**	• Cogeneration Using Digester Biogas • Use of Renewable Energy to Pump Water • Recovery of Excess Line Pressure to Produce Electricity

The report also presents eight case studies, each of which exemplifies a facility that has successfully implemented innovative energy management strategies in practice.

Energy Efficiency Potential

EPRI sponsored an energy efficiency potential study that assessed the potential for energy efficiency and demand response in the U.S. from 2010 to 2030.[3] The study quantified a range of savings from technically feasible to realistically achievable. Given the volatility of energy prices in the past decade and the large amount of energy savings that is technically feasible in the water and wastewater industry, specific predictions of energy efficiency potential in the water and wastewater industry is beyond the scope of this report. Based on the macroscale analysis in the potential study, the team approximates that the realistic achievable potential for the water and wastewater industry by 2030 is approximately 8% of baseline. Yet, with the generation of methane through anaerobic digestion and the recovery of pumping head in drinking water

distribution systems, there is tremendous opportunity for energy recovery in the water and wastewater industry. A concerted and joint effort between electric utilities and the water and wastewater facilities they serve could produce a water and wastewater industry approaching netzero energy use.

[3] *Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010-2030).* EPRI, Palo Alto, CA: January 2009. Product No.1016987.

Opportunities for Demonstration

The target areas of past EPRI RD&D initiatives in the water-energy arena remain relevant today, including the following:

- Energy Efficiency and Demand Response
- Energy Recovery
- Improved Biosolids Treatment
- Water Reuse and Desalination

As with any complex industry, there are hundreds or even thousands of potential demonstration projects that could be proposed. The project team chose to highlight demonstration projects where the interests of electric utilities align with those of the water and wastewater industry. The demonstration opportunities are summarized in Table ES-3. Opportunities that involve electrotechnologies are in bold font type.

In addition to demonstrations of new technologies, there are numerous established technologies that simply need to be more widely implemented. In those cases, EPRI can serve as a change leader in market transformation through the publication and dissemination of fact sheets and technical summary documents. Specifically, EPRI can work with its electric utility members in collaborating with water and wastewater facilities to publicize success stories and promote under-utilized technologies.

Table ES-3 Demonstration Opportunities Identified in the Study

Energy Efficiency, Load Management, and Demand Response	**Energy Recovery**	**Improved Biosolids Treatment**	**Water Reuse and Desalination**
• Deammonification and Other Low Energy Alternatives to Activated Sludge • Advanced SCADA Systems • Automatic Demand Response (Auto-DR) • Distributed Power Generation • Remote Sensing	• Pelton Turbine for Energy Recovery from Water Distribution Systems • Francis Turbine for Energy Recovery from Desalination Plants • Distributed Power	• **Cell Lysis through Chemical or Ultrasonic Means** • **Electrodewatering** • **Microwave Drying of Sludge** • Lystek Process	• **Dual Reverse Osmosis with Chemical Precipitation** • Use of Renewable Energy

• **High-Speed Gearless (Turbo) Blowers**	Generation • **Digester Enhancements to Improve Methane Yield**		

Conclusions and Recommendations

Water and wastewater customers, electric utilities, and water and wastewater utilities can use this report to gain a better understanding of the inextricable link between water and energy. It is intended to serve as a resource for water and wastewater plant characteristics, electricity requirements, and opportunities for improving energy management practices. The report contains descriptions of well-known energy efficiency and demand response measures that still offer potential for greater adoption as well as case studies and demonstration ideas for novel and emerging technologies, processes, and energy management programs. Water and energy engineers and practitioners can use the unit operation data to estimate expected electrical energy use at specific facilities, and assess the effects of selecting different types of unit operations on overall plant energy intensity. Moreover, data on the ranges of energy savings possible with the various technological and programmatic solutions, along with information on regional areas of focus, can serve as a guide to prioritize next steps.

To further advance knowledge for the industry as a whole, the study team has five primary recommendations:

- Develop a formal program directed by a mix of professionals from the water and wastewater industry along with electric utility representatives to study and demonstrate innovative energy management solutions and to disseminate knowledge
- Identify host sites for technology demonstration projects
- Design a software tool to facilitate estimation of plant level energy intensity and annual energy use by aggregation of unit operations
- Conduct a comprehensive energy efficiency and demand response potential study focused specifically on the water and wastewater industries as a follow on to EPRI's 2009 study
- Carry out an assessment of the potential for energy recovery and generation from the water and wastewater industries